

CDP-XA30ES

SERVICE MANUAL

*AEP Model
E Model*



Photo : Gold

Model Name Using Similar Mechanism	NEW
CD Mechanism Type	CDM36A-14A
Base Unit Type	BU-14A
Optical Pick-up Type	KSS-213B

SPECIFICATIONS

Compact disc player

Laser	Semiconductor laser ($\lambda = 780 \text{ nm}$) Emission duration: continuous
Laser output	Max 44.6 μW * * This output is the value measured at a distance of 200 mm from the objective lens surface on the Optical Pick-up block with 7 mm aperture.
Frequency response	2 Hz to 20 kHz $\pm 0.3 \text{ dB}$
Dynamic range	More than 100 dB
Harmonic distortion	CDP-XA50ES: Less than 0.0017 % CDP-XA30ES: Less than 0.0018 %

Outputs

	Jack type	Maximum output level	Load impedance
LINE OUT (FIXED)	Phono jacks	2 V (at 50 kilohms)	Over 10 kilohms
LINE OUT (VARIABLE)	Phono jacks	2 V (at 50 kilohms)	Over 50 kilohms
DIGITAL OUT (OPTICAL)	Optical output connector	-18 dBm	Wave length: 660 nm
DIGITAL OUT (COAXIAL)	Coaxial output connector	0.5 V _{p-p} (75 ohms)	75 ohms
PHONES	Stereo phone jack	28 mW	32 ohms

— Continued on next page —

COMPACT DISC PLAYER

SONY®



General

Power requirements	
Where purchased	Power requirements
Europe	220 V – 230 V AC, 50/60 Hz
Other countries	110 V – 120 V or 220 V – 240 V AC, adjustable, 50/60 Hz
Power consumption	20 W
Dimensions (approx.) (w/h/d)	430 × 125 × 350 mm (17 × 5 × 13 7/8 in.) incl. projecting parts
Mass (approx.)	9.0 kg (19 lbs 13 oz)
Supplied accessories	
Audio cord (2 phono plugs – 2 phono plugs) (1)	
Remote commander (remote) (1)	
Sony SUM-3 (NS) batteries (2)	
Stabiliser (1)	
Design and specifications are subject to change without notice.	

MODEL IDENTIFICATION
– BACK PANEL –

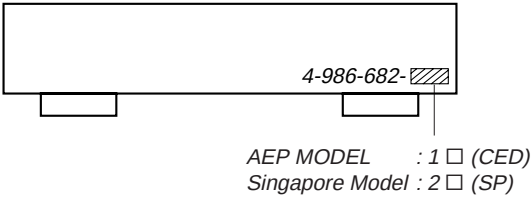


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SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  OR DOTTED LINE WITH MARK  ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SECTION 1 SERVICING NOTES

NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK OR BASE UNIT

The laser diode in the optical pick-up block may suffer electrostatic break-down because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body.

During repair, pay attention to electrostatic break-down and also use the procedure in the printed matter which is included in the repair parts.

The flexible board is easily damaged and should be handled with care.

NOTES ON LASER DIODE EMISSION CHECK

The laser beam on this model is concentrated so as to be focused on the disc reflective surface by the objective lens in the optical pick-up block. Therefore, when checking the laser diode emission, observe from more than 30 cm away from the objective lens.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

Flexible Circuit Board Repairing

- Keep the temperature of the soldering iron around 270 °C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

This appliance is classified as a CLASS 1 LASER product. The CLASS 1 LASER PRODUCT MARKING is located on the rear exterior.

CLASS 1 LASER PRODUCT
LUOKAN 1 LASERLAITE
KLASS 1 LASERAPPARAT

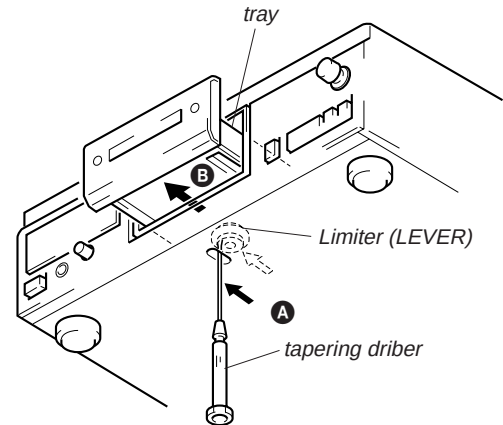
Laser component in this product is capable of emitting radiation exceeding the limit for Class 1.

The following caution label is located inside the unit.

CAUTION : INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED. AVOID EXPOSURE TO BEAM.
ADVARSEL : USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSafbrydere ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.
VORSICHT : UNSICHTBARE LASERSTRÄHLUNG, WENN ABDECKUNG GEÖFFNET UND SICHERHEITSVERRGELUNG ÜBERBRÜCKT. NICHT DEM STRAHL AUSSETZEN.
VARO ! : AVATTAESSA JA SUOJALUKITUS OHJETTAESSA OLET ALT-TIINA NÄKYMÄTTÖMÄLLÄ LASERISÄTELYLLE. ÄLÄ KATSO SÄTEESEEN.
VARNING : OSYNLIG LASERSTRÄLING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÄLEN.
ADVERSEL : USYNLIG LASERSTRÄLING NÄR DEKSEL ÄPNES OG SIKKERHEDSLAS BRYTES. UNNGÅ EKSPONERING FOR STRÄLEN.

1-1. HOW TO OPEN THE DISC TRAY WHEN POWER SWITCH TURNS OFF

- ① Insert a tapering driver into the aperture of the unit bottom, and move the limiter (LEVER) to direction of the arrow **A**.
- ② Pull the tray to direction of the arrow **B**.

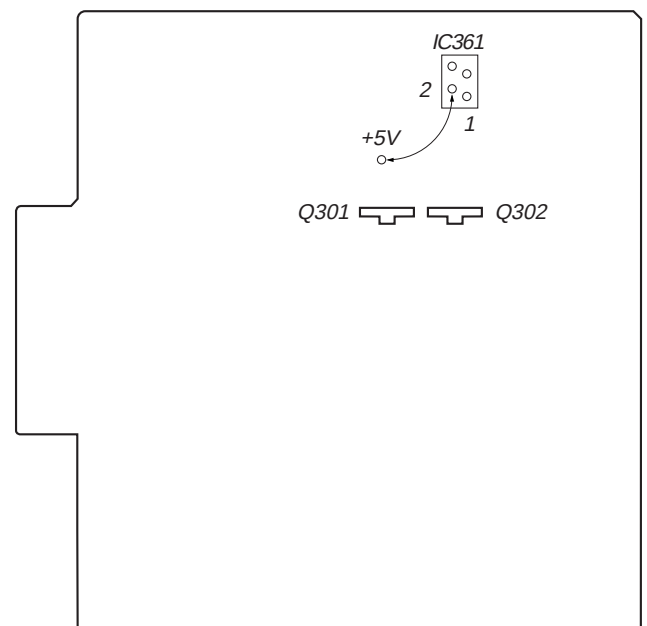


* To close the disc tray, move the driver in the reverse direction (to IN direction).

1-2. PREPARATION FOR ADJUSTMENT AND MEASUREMENT

Perform connecting the IC361 pin ② of BD board to the line of +5V because this unit does not work without the stabilizer structurally.

Connecting Location:
[BD BOARD] (SIDE B)



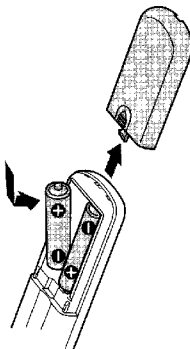
Unpacking

Check that you received the following items:

- Audio connecting cord (1)
- Remote commander (remote) (1)
- Sony SUM-3 (NS) batteries (2)
- Stabiliser (1)

Inserting batteries into the remote

You can control the player using the supplied remote. Insert two R6 (size AA) batteries by matching the + and – on the batteries. When using the remote, point it at the remote sensor  on the player.



When to replace batteries

With normal use, the batteries should last for about six months. When the remote no longer operates the player, replace all the batteries with new ones.

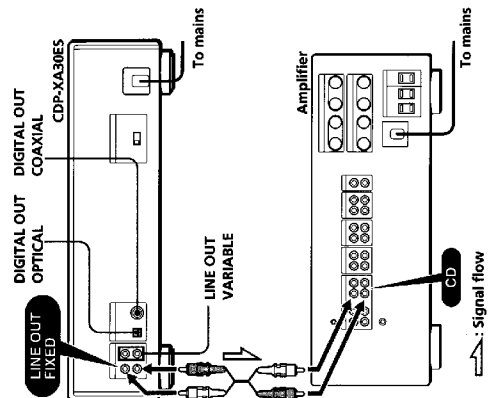
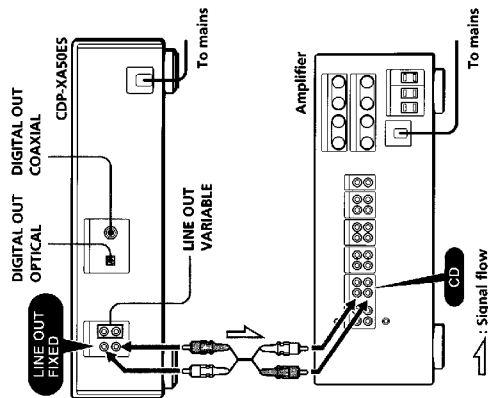
Notes

- Do not leave the remote near an extremely hot or humid place.
- Do not drop any foreign object into the remote casing, particularly when replacing the batteries.
- Do not expose the remote sensor to direct sunlight or lighting apparatuses. Doing so may cause a malfunction.
- If you don't use the remote for an extended period of time, remove the batteries to avoid possible damage from battery leakage and corrosion.

Hooking Up the System

Overview

This section describes how to hook up the CD player to an amplifier. Be sure to turn off the power of each component before making the connections.



What cords will I need?

■ When making analog hookups

- Audio cord (supplied) (1)



■ When making digital hookups

- Optical cable (OC-15 (not supplied))



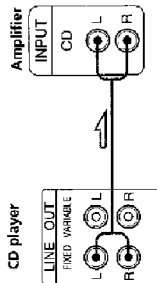
- Coaxial cable (not supplied)



Hookups

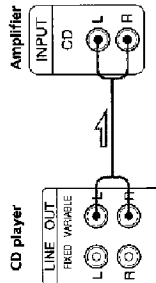
■ When making analog hookups

When connecting an audio cord, be sure to match the colour-coded cord to the appropriate jacks on the components: Red (right) to Red and White (left) to White. Be sure to make connections firmly to avoid hum and noise.



■ If you have an analog power amplifier

Connect the amplifier via the VARIABLE LINE OUT jacks using the supplied audio cord. You can adjust the output level with the LINE OUT/PHONE LEVEL control on the player or the LINE OUT LEVEL buttons on the remote.



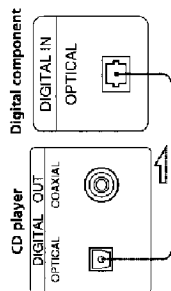
■ When making digital hookups

You can avoid deterioration of the signal during transmission, since the music signal output through the digital output connectors retains digital form. You can connect a digital component such as a digital amplifier, D/A converter, DAT or MD. When you connect a DAT or MD, you can make digital recordings from CDs.

Note that you cannot use fading in or out function (page 19) when making this connection.

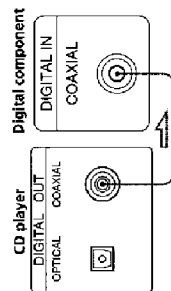
- If you have a digital component with an optical digital input connector

Connect the component via the DIGITAL OUT (OPTICAL) connector using the optical cable (not supplied). Take off the cap and plug in the optical cable.



- If you have a digital component with a coaxial digital input connector

Connect the component via the DIGITAL OUT (COAXIAL) connector using the coaxial cable (not supplied).



Note

When you connect via the DIGITAL OUT connector, noise may occur when you play CD software other than music, such as a CD-ROM.

Setting the voltage selector (voltage selector equipped models only)

Check that the voltage selector on the rear panel of the player is set to the local power line voltage. If not, set the selector in the correct position using a screwdriver before connecting the mains lead to a wall outlet.



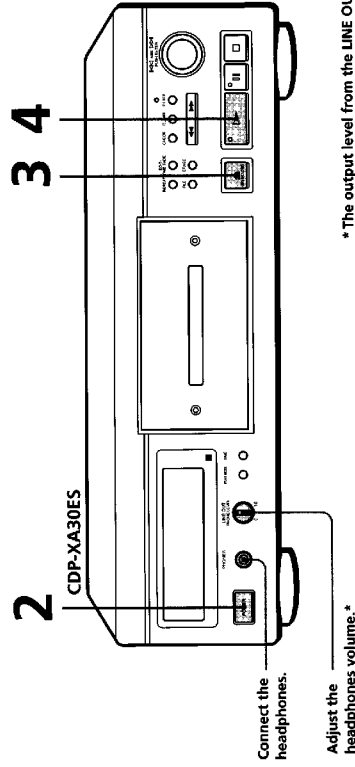
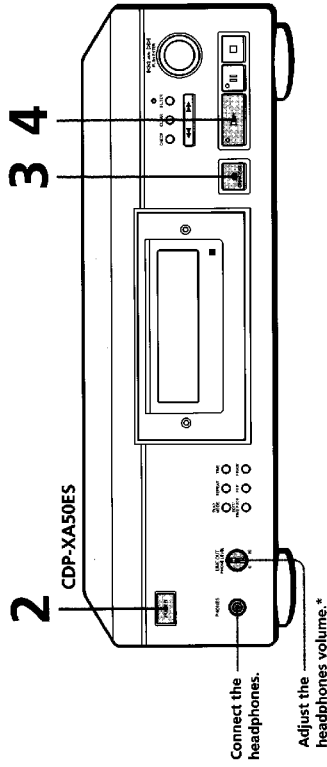
Connecting the mains lead

Connect the mains lead to a wall outlet.

Removing the notice sheet

The notice sheet is put on the player. Remove the sheet before you use your player.

Playing a CD



*The output level from the LINE OUT VARIABLE jacks will also change.

• See pages 4 – 5 for the hookup information.

If you turn on the player with a CD in the tray
You can start playing automatically from the beginning of the CD. If you connect a commercially available timer, you can start playing the CD at any time you want.

1 Turn on the amplifier and select the CD player position.

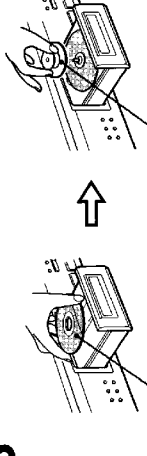
2 Press POWER to turn on the player.

If "-----" appears in the display
Place the supplied stabiliser on the CD.
If you do not, this indication appears.

Note
In Step 3, do not place two or more CDs at the same time. If you do so, you may damage the discs and/or the player.

If play doesn't start from the first track
Press PLAY MODE repeatedly until "SHUFFLE," "PROGRAM" and "CUSTOM INDEX" disappear from the display (or press CONTINUE on the remote).

3 Press **OPEN/CLOSE**, and place a CD on the tray.



With the label side up

Place the supplied stabiliser on the CD. (The stabilisers supplied with the CDP-XA50ES and CDP-XA30ES are different.)

4 Press **▶**.
The disc tray closes and the player plays all the tracks once (Continuous Play).
Adjust the volume on the amplifier.

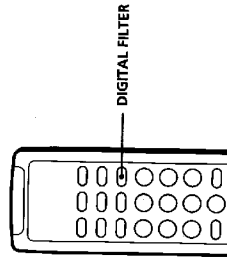
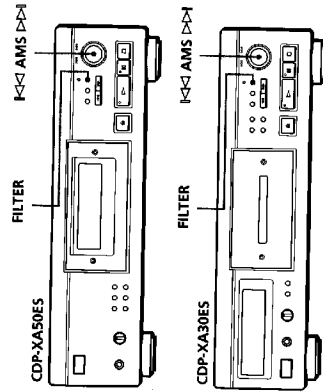
To stop playback

Press **□**.

When you want to	You need to
Pause	Press II
Resume play after pause	Press III or ▶
Go to the next track	Turn AMS ▶▶▶ clockwise. (When using the remote, press ▶▶▶)
Go back to the preceding track	Turn AMS ◀◀◀ anticlockwise. (When using the remote, press ◀◀◀)
Stop play and remove the CD	Press OPEN/CLOSE

Customising the Sound of Your Music (Digital Filter Function)

This player has a variable coefficient (V.C.) digital filter. By selecting the type of filter you want, you can adjust the sound to match your system, your room, the music source, etc.



Selecting the filter directly on the player

- 1 Press **FILTER**.
The display shows the currently selected filter number and the filter indicator flashes.
- 2 Turn **◀▶** AMS **▶▶▶** until the digital filter number you want appears in the display.
As you turn the **◀▶** AMS **▶▶▶** control, the digital filter number changes cyclically as follows:

STD → 1 → 2 → 3A → 3b → 3C → 4A → 4b → 4C

If you are playing a disc, the sound will be interrupted momentarily.

- 3 Push **◀▶** AMS **▶▶▶** to select the filter.
The original display reappears.
The selected digital filter number is stored in memory even if you turn off the power.

You can also change the digital filter number by pressing the FILTER button while the indicator is flashing

Selecting the filter using the remote

- 1 Press **DIGITAL FILTER**.
The display shows the currently selected filter number and the filter indicator flashes.
- 2 Press **DIGITAL FILTER** repeatedly until the display shows the digital filter number you want.
The digital filter number is stored and the original display reappears.

What is a variable coefficient (V.C.) digital filter?

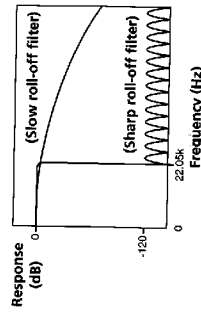
CD players use digital filters to eliminate the noise generated during sampling. You can change the tone of your music by changing the cutoff characteristics of the digital filter.

This player has five types of filters with different coefficient characteristics: "STD," "1," "2," "3," and "4." In addition, digital filters "3" and "4" each have three coefficient patterns, A-C, for more detailed adjustments.

The following explains the terms you need to know to understand the characteristics of the digital filters used in this player.

Sharp roll-off and slow roll-off

Digital filters can be roughly classified into sharp roll-off types and slow roll-off types, according to their cutoff characteristics.



Comparison of cutoff characteristics for sharp roll-off filter and slow roll-off filter

Characteristics of each digital filter

The following are the settings and characteristics for each of the five digital filters. Use this information to select the filter you want.

STD: Standard

This is a sharp roll-off, cascade type filter. It has the same characteristics as the digital filters that have long been used in Sony's high-end units and has a sharp cutoff that reaches -120 dB at 24 kHz. This filter uses the full feed-forward method between the calculation stages and gives the sound a wide range and ample spatial representation.

1: Spline

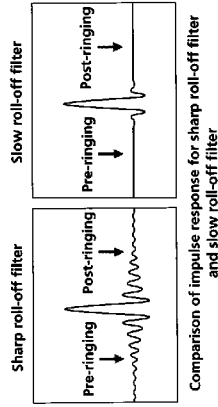
This is a slow roll-off, cascade type filter that uses a cubic spline function for interpolation. The spline function features smoother connections between points, and among spline functions, the cubic filter is the most straightforward. Ringing in the impulse response for this filter is much lower than for a sharp roll-off type filter. With this filter, the sound image is clear and sound reproduction is smooth.

2: Plain

This is a slow roll-off, direct type filter. It features an absence of quantization between the digital filter output and the D/A converter input. Direct type calculations are used within the digital filter and the bit length for the digital filter output and the D/A converter input are the same, so no requantization noise is generated between the digital filter and the D/A converter. This means that, of the 16-bit information taken from the disc, elements up to 20 kHz are input as far as the D/A converter without any nonlinear operation. This reproduces a sound with high clarity and strength.

Sharp roll-off filters steeply cut off the noise generated during sampling over 22.05 kHz. This is a superior way of completely reproducing signals below 20 kHz: the basic principle behind digital audio.

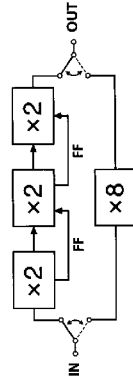
On the other hand, slow roll-off filters cut off the noise generated during sampling gradually, and are able to hold pre-ringing and post-ringing (a kind of sound smearing) in the impulse response signal to a minimum.



Cascade type and direct type

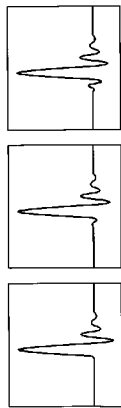
There are two methods of digital filter oversampling: the cascade type and direct type. The cascade type multiplies the signal by eight in three stages, and the direct type multiplies the signal by eight in one step. Cascade filters have a high calculation efficiency, and can realise steep, high-precision sharp roll-off characteristics. Moreover, the ICs in this player use the full feed-forward (FF) method between each of the stages to improve the accuracy of the information transfer.

On the other hand, eightfold oversampling data can be obtained in one step with direct filters and there is no loss during transfer between calculation stages. However, since such circuits are extremely large, this player can only support slow roll-off filters.



3: Analog type

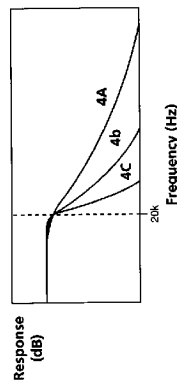
This is a slow roll-off, direct type filter that simulates a seventh-order analog Butterworth filter. This filter completely prevents pre-ringing in the impulse response. Also, since it simulates an analog filter, the high-region phase outside the audible frequency is rotated. The filters from 3A to 3C differ in degree of phase rotation. 3A is multiplied by 0.75, and 3C is multiplied by 0.5. The impulse response changes as shown in the figures below. The degree of pre-ringing and post-ringing varies with the degree of phase change. This gives the sound a feeling of warmth and depth.



Comparison of filter 3 impulse response

4: Butterworth

This is a slow roll-off, direct type filter and includes fifth-order through ninth-order Butterworth filters. However, the phase is linear and does not include the phase change possibilities of filter 3 (analog type). As the figure below shows, only the cutoff characteristics can be changed in the fifth-order (4A), the seventh-order (4b) and the ninth-order (4C). Ringing in the impulse response increases from the fifth-order filter to the ninth-order filter. This filter gives the sound a feeling of balance and comfort.



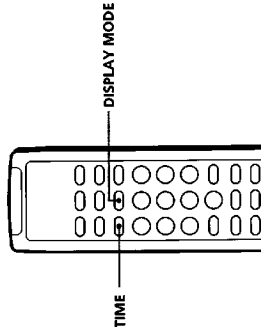
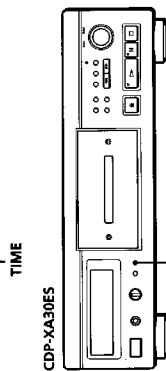
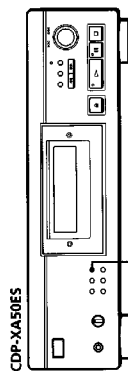
Comparison of filter 4 cutoff characteristics

Note

The Digital Filter function primarily changes characteristics outside the audible frequency. They cannot affect changes within the audible frequency such as those provided by the tone controls of the amplifier. Therefore, with certain combinations of hardware and software, there may be no noticeable effect after switching the filter.

Using the Display

You can check information about the disc using the display.



Checking the total number and playing time of the tracks

Press TIME before you start playing. The display shows the total number of tracks, total playing time and music calendar.



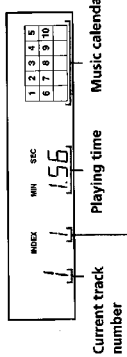
Total number of Total playing time Music calendar tracks

While in Shuffle Play mode ("SHUFFLE" appears in the display, see page 13), a one-second access time blank is added between each track. This increase is automatically added to the total playing time in the display.

If the disc has more than 15 tracks, the ► indication appears next to 15 on the music calendar. The information also appears when you press $\ominus$ OPEN/CLOSE to close the disc tray.

Display information while playing a disc

While playing a disc, the display shows the current track number, index number, playing time and the music calendar.

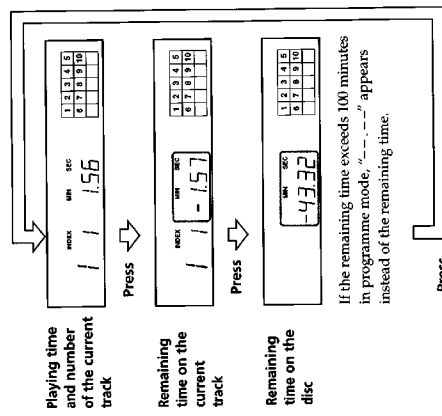


Current track number Index number (page 12) or Custom Index number (page 22)

The track numbers in the music calendar disappear after they are played.

Checking the remaining time

Each time you press TIME while playing a disc, the display changes as shown in the chart below.



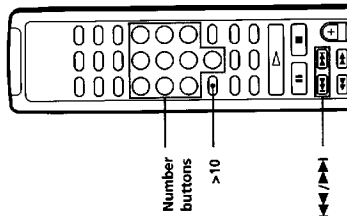
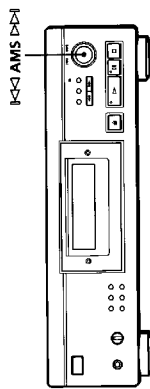
If the remaining time exceeds 100 minutes in programme mode, "----" appears instead of the remaining time.

Turning off the music calendar in the display

Each time you press DISPLAY MODE on the remote while playing a disc, the music calendar turns off and on alternately in the display.

Locating a Specific Track

You can quickly locate any track while playing a disc using the AMS (Automatic Music Sensor) on the player or number buttons on the remote.



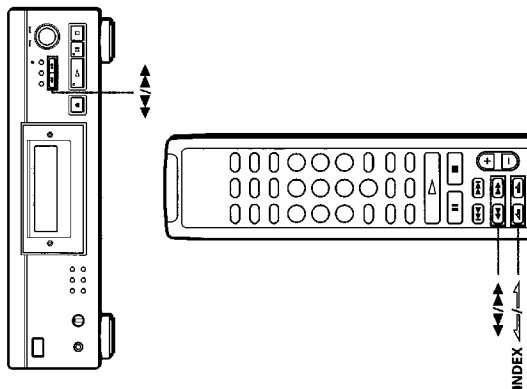
To locate	You need to
The next or succeeding tracks	Turn $\lll$ AMS $\ggg$ clockwise until you find the track. When using the remote, press $\ggg$ repeatedly until you find the track.
The current or preceding tracks	Turn $\lll$ AMS $\ggg$ anticlockwise until you find the track. When using the remote, press $\lll$ repeatedly until you find the track.
A specific track directly	Press the number button of the track on the remote

When you directly locate a track numbered over 10

Press >10 first, then the corresponding number buttons on the remote. To enter "0," use button 10.
Example: To play track number 30
Press >10 first, then 3 and 10.

Locating a Particular Point in a Track

You can also locate a particular point in a track while playing a disc.



To locate a point

While monitoring the sound

Press **▶▶** (forward) or **◀◀** (backward) and hold down until you find the point

Quickly by observing the display during pause

Press **◀◀/▶▶** and hold down until you find the point. You will not hear the sound during the operation.

Using an index (only for indexed discs)

Press **INDEX** **◀=** or **▶=** on the remote repeatedly until you find the point

What is an index?

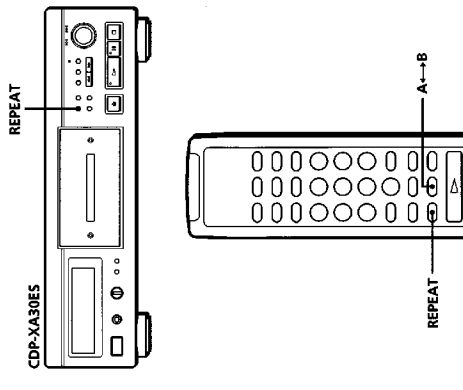
It is a number that divides a track or a disc into sections, enabling you to easily locate a desired point. You can determine if a disc uses indexes by its packaging.

Note

If "7" appears in the display, the disc has reached the end while you were pressing **▶▶**. Press **◀◀** or turn **◀◀** AMS **▶▶** anticlockwise to go back.

Playing Tracks Repeatedly

You can play tracks repeatedly in any play mode.



Press **REPEAT** while playing a disc. "REPEAT" appears in the display. The player repeats the tracks as follows:

When the disc is played in

The player repeats

Continuous Play (page 6)

All the tracks

Shuffle Play (page 13)

All the tracks in random orders

Programme Play (page 14)

The same programme

Delete Play (page 16)

All the remaining tracks

Delete Shuffle Play (page 14, 16)

All the remaining tracks in random orders

Custom Index Play (page 23)

The portion between two indexes

To cancel Repeat Play

Press **REPEAT** repeatedly until "REPEAT" disappears from the display.

Repeating the current track

You can repeat only the current track.

While the track you want is being played, press **REPEAT** repeatedly until "REPEAT 1" appears in the display.

Note

You cannot repeat the current track while the disc is played in Custom Index Play mode (see page 23).

Repeating a Specific Portion (A<->B Repeat)

You can play a specific portion in a track repeatedly. This might be useful when you want to memorise lyrics.

Note that you cannot repeat a portion extending to two tracks.

1 While playing a disc, press **A<->B** on the remote when you find the starting point (point A) to be played repeatedly. "A-" of "REPEAT A-" flashes in the display.

2 When you reach the ending point (point B), press **A<->B** again. "REPEAT A-B" appears. The player plays this specific portion repeatedly.

To cancel A<->B Repeat

Press **REPEAT**.

Setting a new starting point

You can move the repeating portion ahead by changing the starting point.

1 Press **A<->B** while the player is repeating the specific portion.

The ending point B becomes the new starting point A. "A-" of "REPEAT A-" flashes in the display.

2 When you reach the ending point (point B), press **A<->B** again.

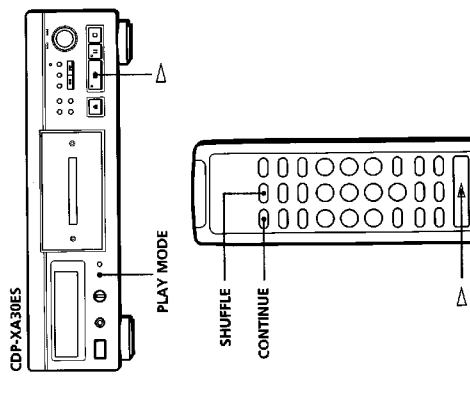
"REPEAT A-B" appears. The player repeats between the new starting and ending points.

When you want to restart from the starting point A

Press **▶** during **A<->B Repeat**.

Playing in Random Order (Shuffle Play)

You can have the player "shuffle" tracks and play in a random order.



1 Press **PLAY MODE** repeatedly until "SHUFFLE" appears in the display. When using the remote, press **SHUFFLE**.

2 Press **▶** to start Shuffle Play. The **◻** indication appears while the player is "shuffling" the tracks.

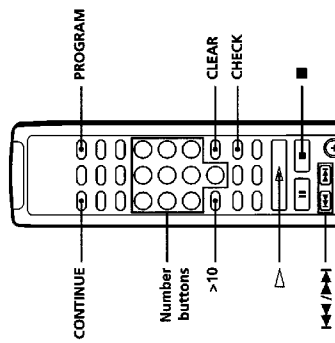
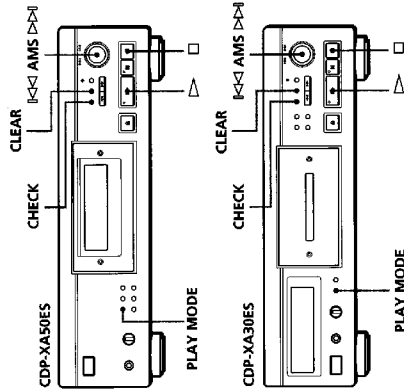
To cancel Shuffle Play

Press **PLAY MODE** four times (or **CONTINUE** on the remote).

- You can start Shuffle Play while playing**
Press PLAY MODE once (or SHUFFLE on the remote), and Shuffle Play starts from the current track.
- You can delete unwanted tracks during Shuffle Play (Delete Shuffle Play)**
Press the number button of the track you want to delete on the remote.
The track number and "OFF" appear in the display, and then the track number disappears from the music calendar.
If you want to restore the track, press the number button again.
To restore all the tracks, press $\square$ in stop mode.

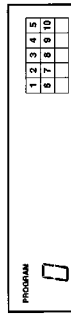
Creating Your Own Programme (Programme Play)

You can arrange the order of the tracks on a disc and create your own programme. The programme can contain up to 24 tracks.



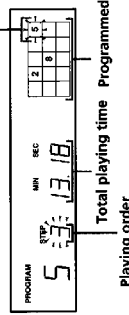
Creating a programme on the player

- 1 Press PLAY MODE repeatedly until "PROGRAM" appears in the display before you start playing.

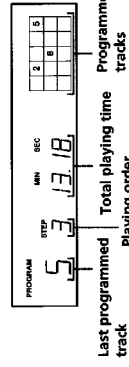


- 2 Turn $\llcorner$ AMS $\triangleright$ until the track number you want appears in the display.
The playing order and the track numbers being programmed flash and the total playing time including the track appears in the display.

Track numbers being programmed



- 3 Push $\llcorner$ AMS $\triangleright$ to select the track.



If you've made a mistake
Press CLEAR, then repeat Steps 2 and 3.

- 4 Repeat Steps 2 and 3 to programme the tracks in the order you want.

- 5 Press $\triangleright$ to start Programme Play.

To cancel Programme Play
Press PLAY MODE three times.

- When tracks, which aren't numerically consecutive on the disc, are programmed consecutively (i.e. 1, 3, 5 etc.)**
A one-second access time blank is added between the tracks.

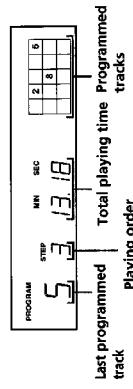
The programme remains even after the Programme Play ends
When you press $\triangleright$, you can play the same programme again.

Notes

- "..." appears instead of the total playing time in the display when it exceeds 100 minutes.
- "FULL" appears in the display when you try to add a track to a programme which already contains 24 tracks.

Creating a programme using the remote

- 1 Press PROGRAM before you start playing.
"PROGRAM" appears in the display.
- 2 Press number buttons of the tracks you want to programme in the order you want.
Example: To programme the tracks 2, 8 and 5
Press number buttons in the order 2, 8 and 5.



To select a track with a number over 10
Use >10 button (see page 11).

If you've made a mistake
Press CLEAR, then press the correct track number.

- 3 Press $\triangleright$ to start Programme Play.

To cancel Programme Play
Press CONTINUE.

You can check the total playing time while programming using the remote (Programme Edit)
To select a track, press $\llcorner$ or $\triangleright$ and check the total playing time. Then press PROGRAM to confirm your selection.

When tracks, which aren't numerically consecutive on the disc, are programmed consecutively (i.e. 1, 3, 5 etc.)
A one-second access time blank is added between the tracks.

The programme remains even after the Programme Play ends
When you press $\triangleright$, you can play the same programme again.

Notes

- "..." appears instead of the total playing time in the display when it exceeds 100 minutes.
- "FULL" appears in the display when you try to add a track to a programme which already contains 24 tracks.

Checking the track order

You can check your programme before or after you start playing.

Press CHECK.

Each time you press this button, the display shows the track number in the programmed order. After the last track in the programme, the display shows "End" and returns to the original display. If you check the order after you start playing, the display shows only the remaining track numbers.

Changing the track order

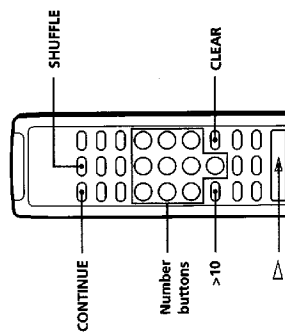
You can change your programme before you start playing.

To

You need to	
Erase a track	Press CHECK until the track you don't want appears in the display, then press CLEAR.
Erase the last track in the programme	Press CLEAR. Each time you press the button, the last track will be cleared.
Add tracks to the end of the programme	Turn $\blacktriangleleft$ AMS $\blacktriangleright$ until track number you want to add appears, then push $\blacktriangleleft$ AMS $\blacktriangleright$. When using the remote, press the number button of the tracks to be added.
Change the whole programme completely	Hold down CLEAR until "ALL CLR" appears in the display. Create a new programme following the programming procedure.

Playing Only Specific Tracks (Delete Play)

You can delete unwanted tracks and play only the remaining tracks.



- 1 Press SHUFFLE. "SHUFFLE" appears in the display.

- 2 Press the number buttons of the tracks you want to delete.

The track numbers disappear from the music calendar after "OFF" appears for a while. To delete a track numbered over 10, use the >10 button (see page 11).

If you've made a mistake

Press the number button of the track. "On" appears in the display and the track will be restored.

- 3 After you've deleted all the tracks you don't want, press CONTINUE.

"SHUFFLE" disappears from the display.

If you press PLAY MODE on the player instead of CONTINUE on the remote

The deleted tracks will be restored. Be sure to do this step with the remote.

- 4 Press $\blacktriangleright$ to start Delete Play.

To cancel Delete Play
Press $\blacksquare$ in stop mode.

The player keeps the deleted tracks in memory even after the Delete Play ends

When you press $\blacktriangleright$, you can play only the remaining tracks again.

You can play the tracks in random order (Delete Shuffle Play)

Just skip Step 3 in the above procedure.

You can delete a track while playing

Press CLEAR while the track is being played. The player deletes the track and starts playing the next track.

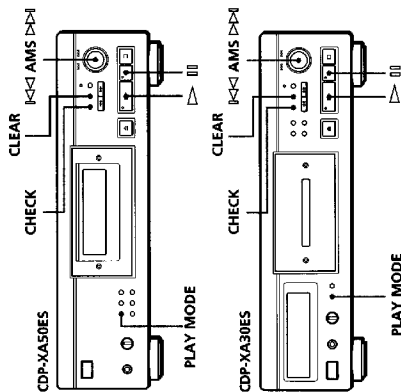
You can store the deleted tracks of each disc

See "Storing Specific Tracks of a Disc" on page 24.

Recording Your Own Programme

You can record the programme you've created on a tape, DAT or MD. The programme can contain up to 24 tracks.

By inserting a pause during programming, you can divide the programme into two for recording on both sides of a tape.



- 1 Create your programme (for side A when recording on a tape) while checking the total playing time indicated in the display. See "Creating Your Own Programme" on page 14.
- 2 When you record on both sides of the tape, press $\blacksquare$ to insert a pause. The "P" indication appears in the display and the playing time is reset to "0.00." When you record on one side of the tape or on a DAT or MD, skip this step and go to Step 4.
- 3 Repeat Step 1 to create the programme for side B.
- 4 Start recording on the deck and then press $\blacktriangleright$ on the player. When you record on both sides of the tape, the player pauses at the end of the programme for side A.
- 5 When you record on side B, reverse the tape and press $\blacktriangleright$ or $\blacksquare$ on the player to resume playing.

To check and change your programme

See pages 15 and 16.

"SIDE-A" appears while checking the programme for side A and "SIDE-B" while checking the programme for side B.

You can automatically insert a blank space of 3 seconds between each track

Use the Auto Space function (see page 21).

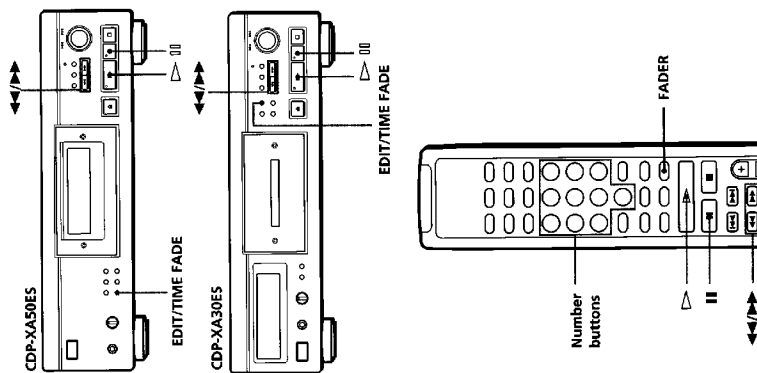
Fading In or Out

You can manually fade in or out to prevent tracks from starting or ending abruptly.

Note that you cannot use this effect when you use the DIGITAL OUT connector.

- 2 Press ◀◀ or ▶▶ to specify the tape length. Each time you press these buttons, the display changes as shown below, with the tape length of one side following each indication.
- | | | | | | |
|---------|---------|---------|---------|---------|---------|
| → HALF | → C+6 | → C-54 | → C-60 | → C-74 | → C-90 |
| (23.00) | (27.00) | (30.00) | (37.00) | (57.00) | (65.00) |
- “ $\frac{(foot)}{in}$ ” appears and “SIDE-A” flashes in the display.

When you select "HALF"
The player sets the programme of each side to a half of the total playing time of the disc. Note that you cannot select "HALF" when the disc has more than 24 tracks.



-  **You can automatically insert a blank space of 3 seconds between each track**
Use the Auto Space function (see page 21).
-  **You can check and change the programme**
See pages 15 and 16.

Press PLAY MODE repeatedly until "SHUFFLE," "PROGRAM" and "CUSTOM INDEX" disappear from the display (or press CONTINUE on the remote).

To	Press FADER
Start play fading in 	During pause. "FADE" flashes and play fades in.
End play fading out 	When you want to start fading out. "FADE" flashes. The play fades out and the player pauses.

Changing the fading time

You can change the fading time from 2 to 10 seconds before fading in or out. If you don't change it, fading lasts for 5 seconds.

- 1 Press FADER before you start playing.
"5 SEC" appears and "FADE" flashes in the display.
- 2 Press the number button to specify the fading time.
You can also specify the fading time by pressing the ◀/▶ buttons until the display shows the time you want.

Fading out at the specified time (Time Fade)

You can have the player fade out automatically by specifying the playing time. Once you set the Time Fade, it works twice, that is, the play fades out at the end of both sides of a tape.

- 1 Press EDIT/TIME FADE three times before you start playing.
"(TIME)" and "SIDE-A" appear in the display.
- 2 Press ◀ or ▶ to specify the playing time.
Each time you press these buttons, the display changes as shown below, with the playing time of one side following each indication.

HALF	→ C-46	→ C-54	→ C-60	→ C-74	→ C-90	→ ...
	(23:00)	(27:00)	(30:00)	(37:00)	(45:00)	

When you select "HALF"

The player sets the playing time to a half of the total playing time.

- 3 Press ▷ to start playing.
At the specified time the play fades out with "FADE" flashing in the display and the player pauses. "SIDE-B" appears in the display.

- 4 To record on side B, reverse the tape and press ▷ or ⏮ on the player to resume playing.
Again, the play fades out at the specified time.

To cancel Time Fade
Press EDIT/TIME FADE.

 **You can freely specify the playing time**
See "You can freely specify the tape length" on page 19.

 **You can change discs during Time Fade**
If the play ends before the specified fade-out time, (for example, when you record CD-singles on a tape) change the disc. The specified fade-out time is counted only during playing.

 **You can fade in to resume playing in Step 4 **
After you reverse the tape, press FADER.

Note
If you press ◀◀ or ▶▶ during Time Fade Play, Time Fade will be cancelled.

Locating each track on a tape using the AMS function (Auto Space)

The Auto Space function inserts a blank space of 3 seconds between each track while playing, and enables you to locate each track using the AMS function of the deck.

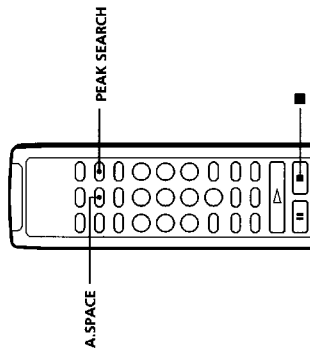
Before you start playing, press A SPACE.
"AUTO SPACE" appears in the display.

To cancel Auto Space
Press A SPACE until "AUTO SPACE" disappears from the display.

Note
If you use the Auto Space function when recording, for example, a medley or symphony, the sound may be interrupted where the track number changes. It happens when the track numbers are assigned in the middle of the piece.

Useful Tips for Recording

Using these functions makes recording CDs more convenient.



Adjusting the Recording Level (Peak Search)

The player locates the highest level among the tracks to be recorded to let you adjust the recording level before you start recording.

- 1 Before you start playing, press PEAK SEARCH.
"PEAK" flashes in the display and the player repeats the portion of the highest level.
- 2 Adjust the recording level on the deck.
- 3 Press ■ on the player to stop Peak Search.
"PEAK" disappears from the display.

Note
The portion with the highest level may differ every time you try the adjustment on the same disc. The difference is, however, so slight that you won't find any problem in adjusting the recording level precisely.

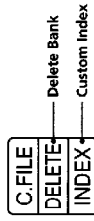
What You Can Do With the Custom Files

The player can store 2 types of information called "Custom Files" for each disc. Once you have stored Custom Files for a disc, the player automatically recalls what you have stored whenever you insert the disc. Note that Custom Files will be erased if you don't use the player for about 1 month.

You can store this information:

When you use	You can
Custom Index (page 22)	Index the disc at up to 8 points (for a disc with 32 tracks or less) or 5 points (for a disc with over 32 tracks)
Delete Bank (page 24)	Delete unwanted tracks and store only the tracks you want

The Custom File indication lights up when you store the corresponding information.



When you store a Custom File for a disc, the player remembers how you played that disc last time even if you removed the disc from the player (last mode memory). When you insert the same disc again, therefore, the player plays in the same play mode. The player also remembers the duration of fade in/out time if you've changed the time. Note that when you press $\triangleright$ to close the disc tray and start playing, the player plays in the play mode currently selected instead of the stored one.

Where are Custom Files stored?

Custom Files are stored not on the disc but in the player's memory. This means you cannot use Custom Files when you play the disc on other players.

How many discs can you file?

You can file up to 224 discs in the Custom File. The player counts a disc as one even when you store the Custom Index and Delete Bank at the same time.

You can check how many discs you can file

- 1 Remove the disc from the player.
- 2 Press Δ OPEN/CLOSE to close the disc tray.
- 3 Press TIME while the music calendar disappears from the display. The number of the Custom Files you can file appears.

If "FULL" appears in the display

If the memory for Custom Files becomes full, the player displays "FULL." when you press FILE to store the information and you cannot store any more disc information. If necessary, erase any unwanted Custom Files (see pages 24 and 25).

To erase all Custom Files of all discs

While holding down ERASE and FILE, press POWER to turn on the player. "FILE CLR" appears in the display and all the custom files will be erased.

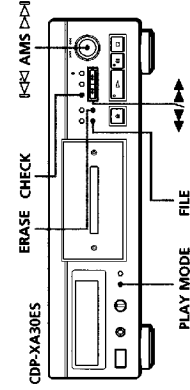
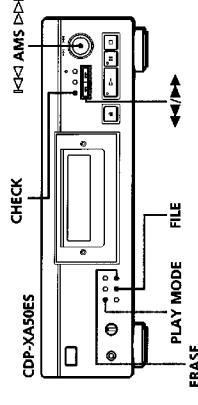
Indexing a Disc (Custom Index)

You can index a disc at up to 8 points (for a disc with 32 tracks or less) or 5 points (for a disc with over 32 tracks) so that you can easily locate a desired point. This might be useful when you play discs of symphonies or concertos that divide one piece into several tracks (see the example below).

Example

Track No.	First piece	Second piece	Third piece
1	2	3	4
5	6	7	8
9			

Custom Index No. 1 2 3



Playing from an indexed point (Custom Index Play)

- 1 Press PLAY MODE repeatedly until "CUSTOM INDEX" appears in the display. When using the remote, press C.INDEX.

- 2 Locate the Custom Index you want as follows:

To locate	Press
The next Custom Index	INDEX $\triangleright$
The current Custom Index	INDEX $\triangleleft$
A specific Custom Index directly	Number button of the Custom Index

Playback starts from the selected Custom Index to the end of the disc.

To cancel the Custom Index Play

Press PLAY MODE twice (or CONTINUE on the remote).

Notes

- You cannot use the Index Search function (see page 12).
- Use INDEX $\triangleleft$ / $\triangleright$ buttons to locate the next or the current Custom Indexes, instead of $\triangleleft$ / $\triangleright$ buttons on the remote.

Playing from one index to the next one (Custom Index Single Play)

- 1 Press PLAY MODE repeatedly until "CUSTOM INDEX (1)" appears in the display. When using the remote, press C.INDEX.
- 2 Press the number button of the Custom Index you want on the remote. Playback starts from the selected Custom Index and stops at the beginning of the next index. To cancel the Custom Index Single Play, press PLAY MODE once (or CONTINUE on the remote).

You can play the portion between two indexes repeatedly
Press REPEAT.

- 1 Insert the disc.

- 2 Press PLAY MODE repeatedly until "CUSTOM INDEX" appears in the display. When using the remote, press C.INDEX. The music calendar disappears.

- 3 Press FILE at the point you want to index. The Custom Index number flashes in the display. The player repeats the portion for 3 seconds from the point to be indexed.

- 4 Press $\triangleleft$ or $\triangleright$ to adjust the point so that the player can repeat from the exact point you want to index. Pressing these buttons 7 times moves the point by about 1 second ahead or behind.

If you don't want to index at the point

Press CLEAR and search another point to be indexed.

- 5 Press FILE again to store the Custom Index. "INDEX" in the Custom File indication lights up in the display.

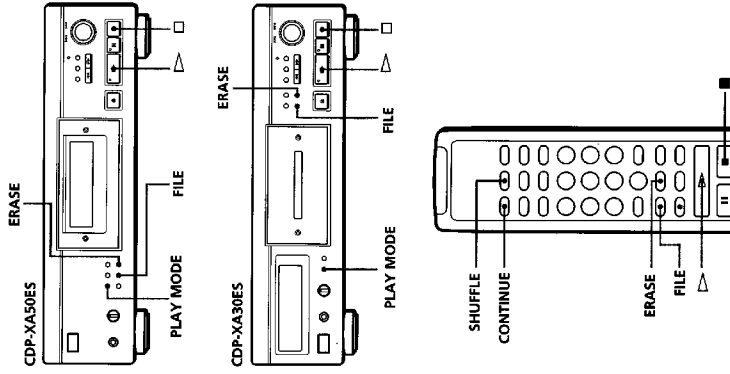
- 6 To mark more Custom Indexes, repeat Steps 3 to 5.

Erasing the Custom Index

- 1 Insert the disc.
- 2 Press PLAY MODE repeatedly until "CUSTOM INDEX" appears in the display.
When using the remote, press C.INDEX.
- 3 Press CHECK repeatedly until the Custom Index number you want to erase flashes.
- 4 Press ERASE while the number is flashing to erase the Custom Index.
The succeeding Custom Index numbers decrease by one.

Storing Specific Tracks of a Disc (Delete Bank)

You can delete unwanted tracks and store only the tracks you want. You can start playing your favourite tracks without deleting tracks each time.



- 1 Insert the disc.
- 2 Delete tracks you don't want.
Follow Steps 1 to 3 in "Playing Only Specific Tracks" on page 16.
- 3 Press FILE to store the remaining tracks.
"DELETE" in the Custom File indication lights up in the display.

Playing using the Delete Bank

- 1 Press PLAY MODE repeatedly until "SHUFFLE," "PROGRAM" and "CUSTOM INDEX" disappear from the display.
When using the remote, press CONTINUE.
The Delete Bank is recalled and the selected track numbers appear on the music calendar.
- 2 Press ▷ to start playing.

To cancel playing using the Delete Bank
Press □.

To start playing using the Delete Bank again
While "PROGRAM" or "CUSTOM INDEX" appears in the display, press PLAY MODE repeatedly until these indications disappear from the display or until "SHUFFLE" appears in the display. The Delete Bank is recalled and you can start playing by pressing ▷.

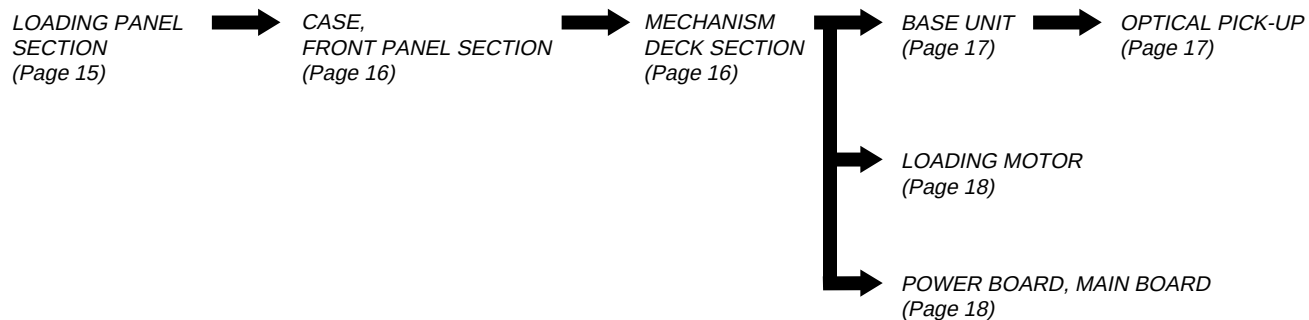
You can play in a random order using the Delete Bank
In Step 1, press PLAY MODE repeatedly until "SHUFFLE" appears in the display (or press SHUFFLE on the remote).

Erasing the Delete Bank

- 1 Insert the disc.
- 2 Press PLAY MODE repeatedly until "PROGRAM" and "CUSTOM INDEX" disappear from the display.
When using the remote, press CONTINUE or SHUFFLE.
The display shows the stored Delete Bank.
- 3 Press ERASE to erase the Delete Bank.
"DELETE" in the Custom File indication disappears.

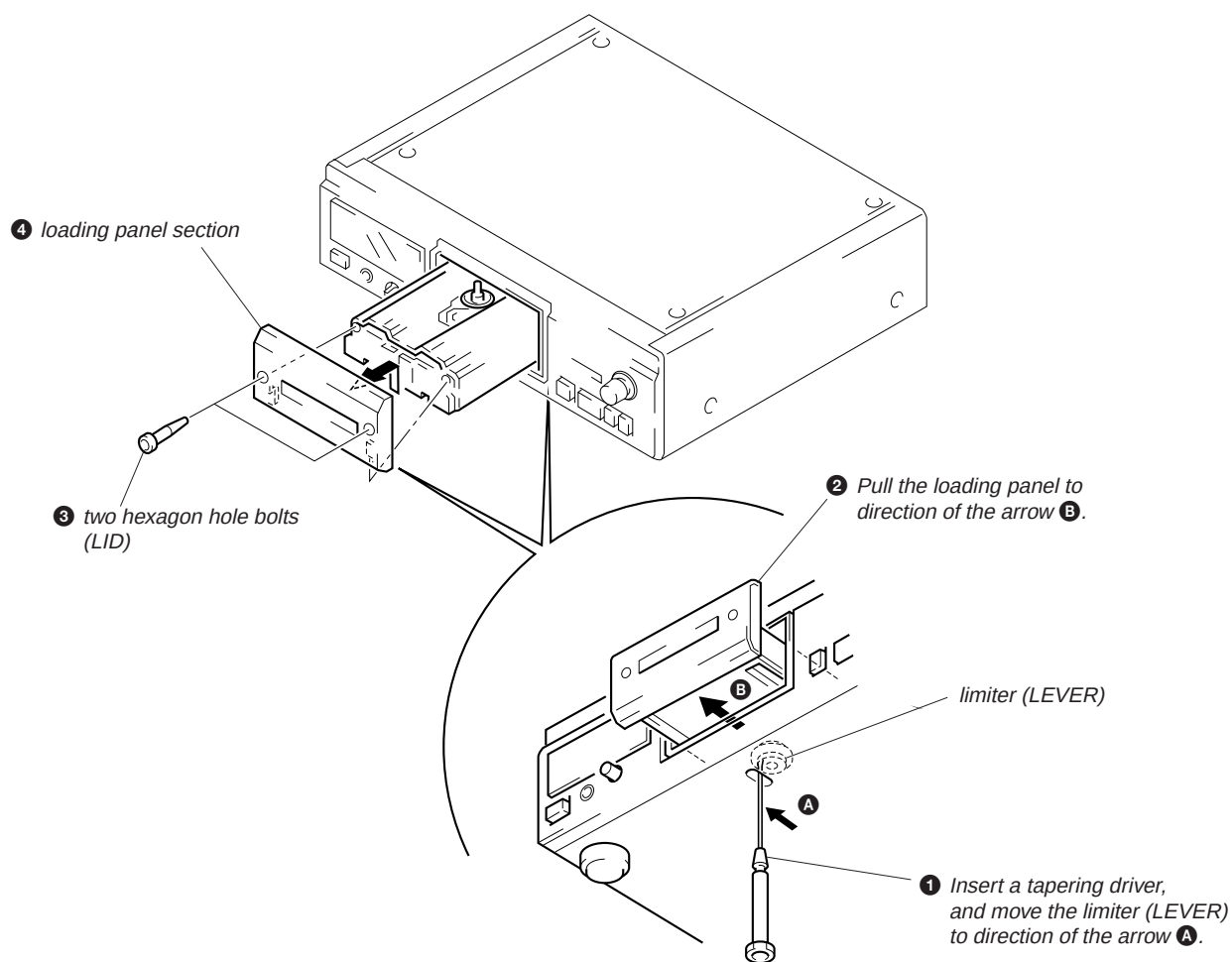
SECTION 3 DISASSEMBLY

- This set can be disassembled in the order shown below.

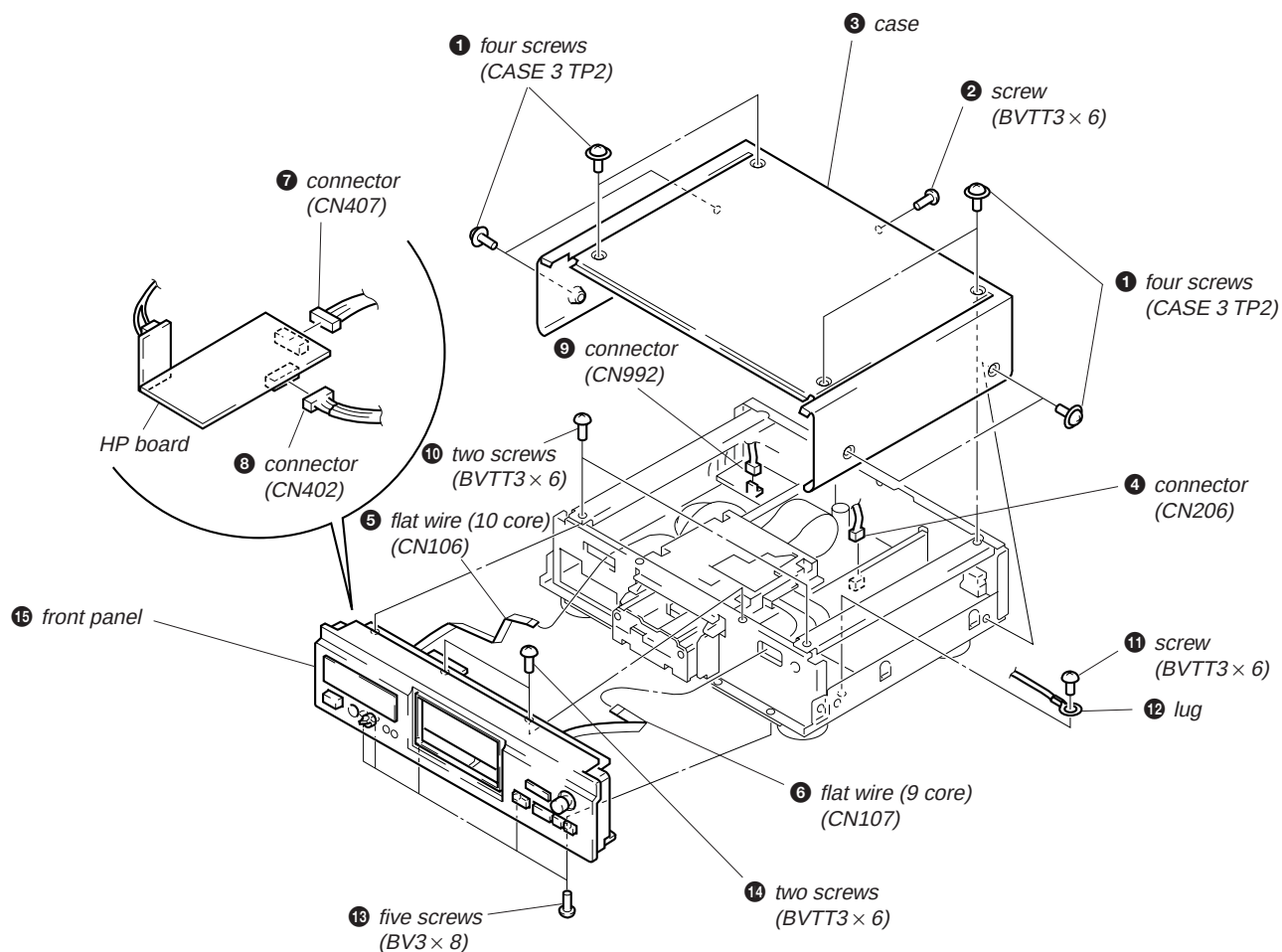


Note: Follow the disassembly procedure in the numerical order given.

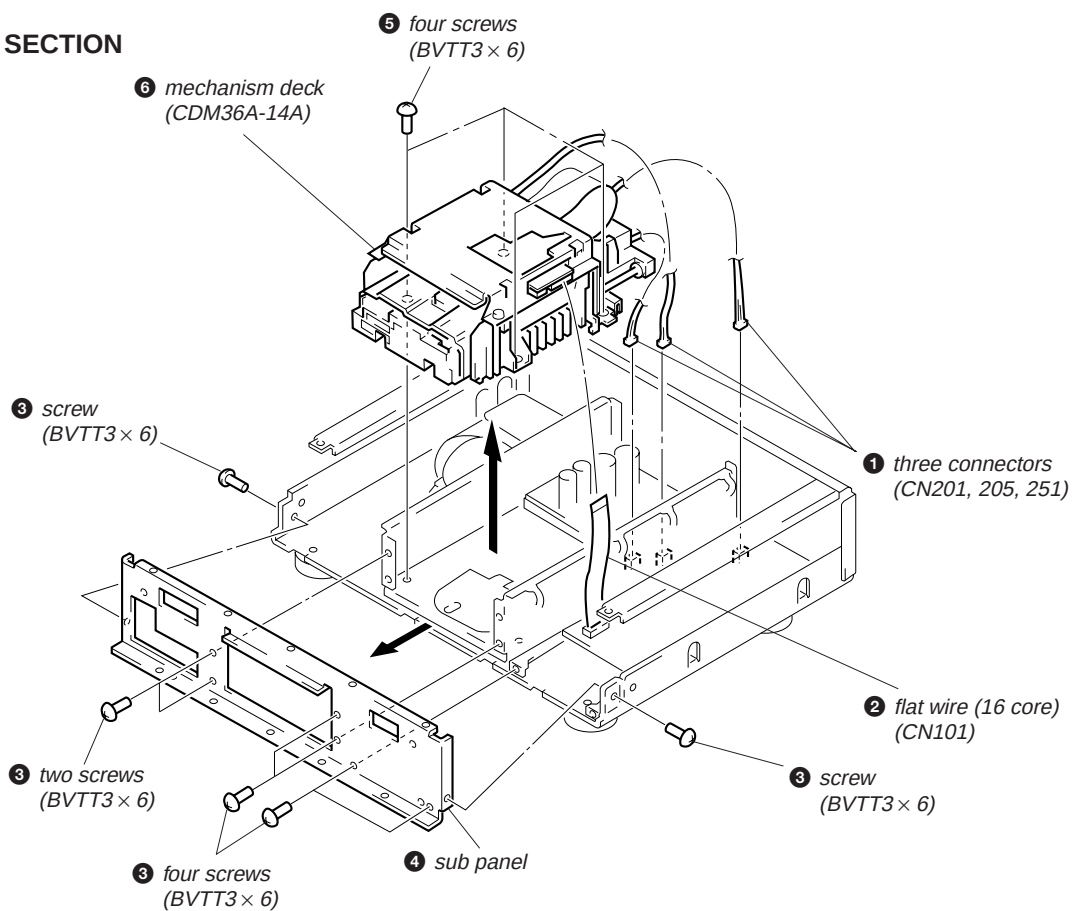
LOADING PANEL SECTION



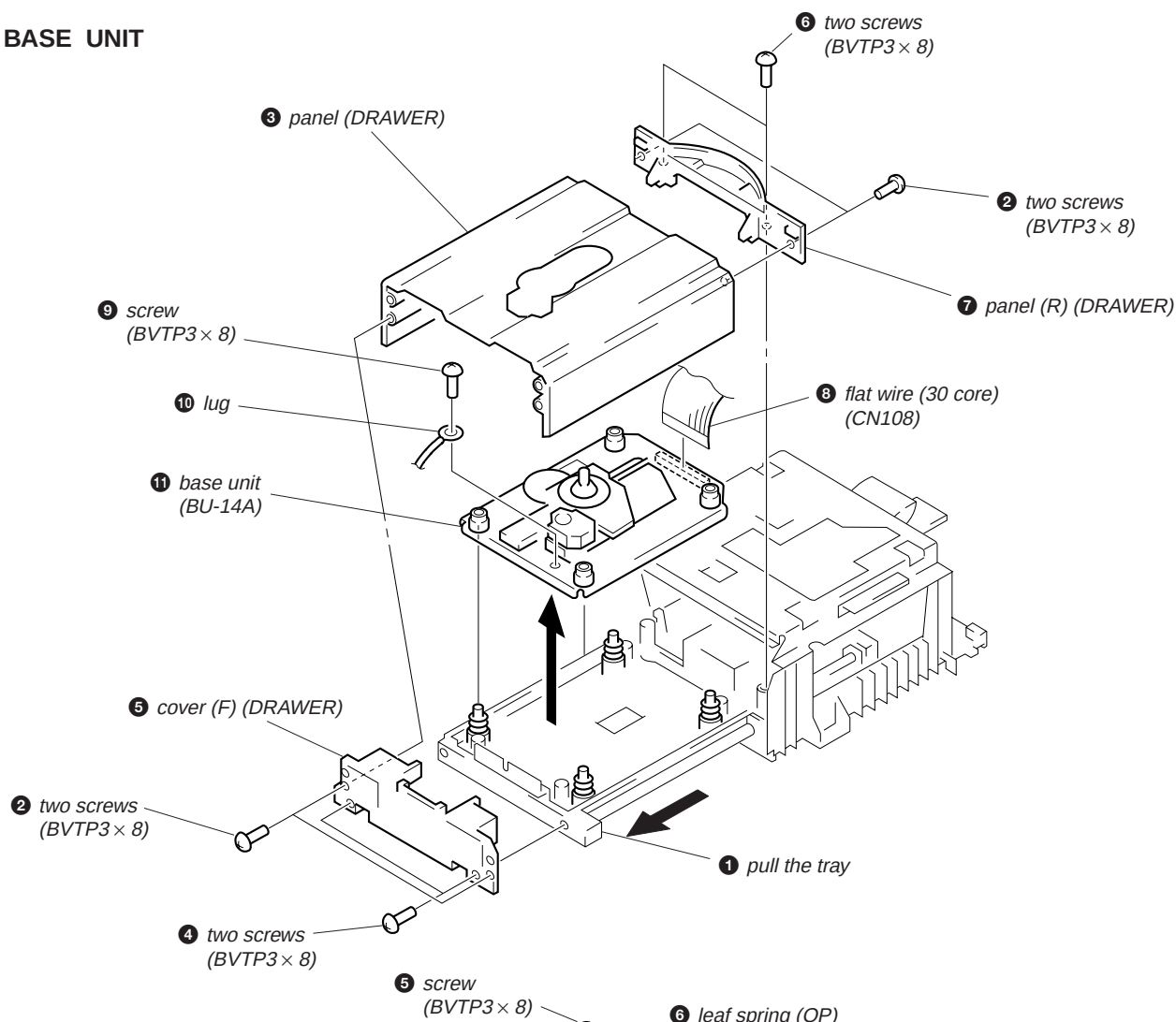
CASE, FRONT PANEL SECTION



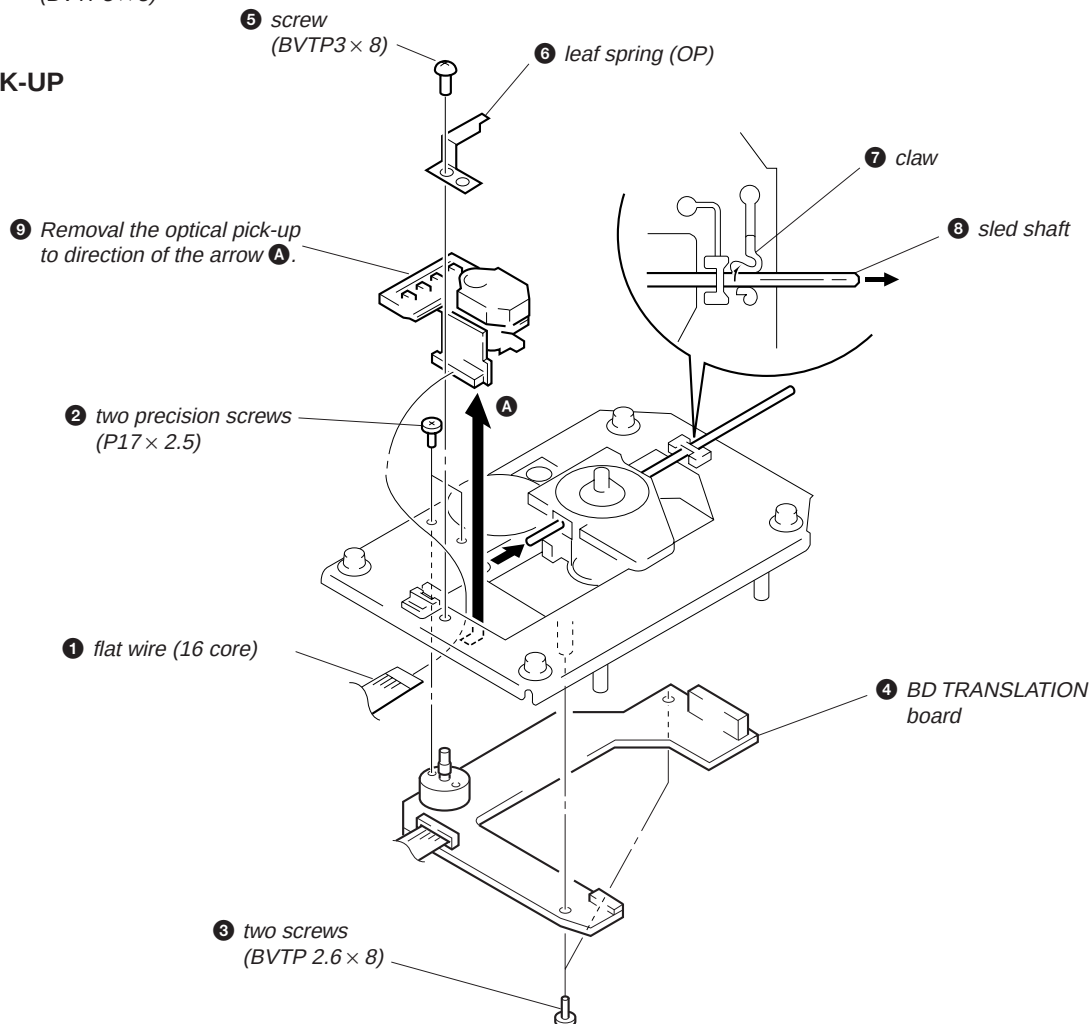
MECHANISM DECK SECTION



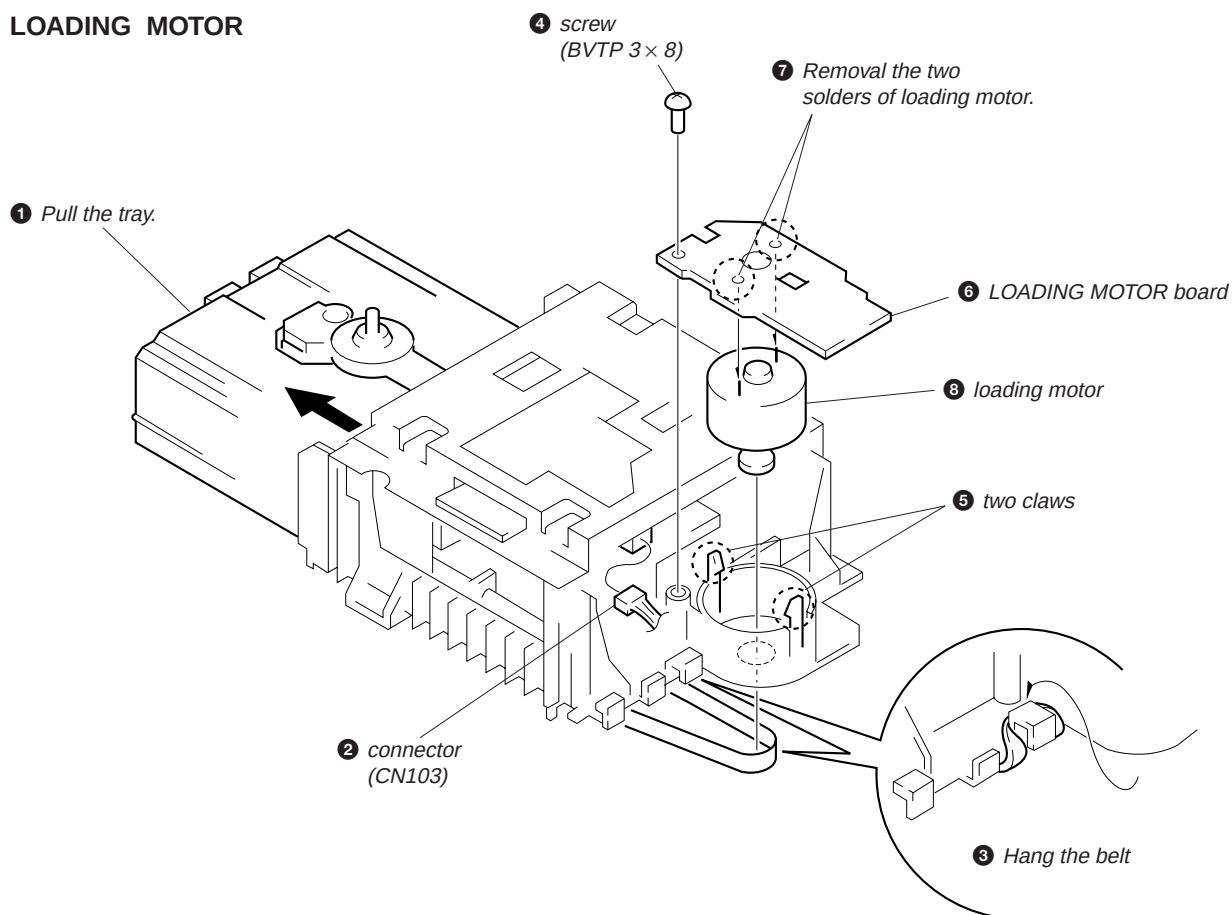
BASE UNIT



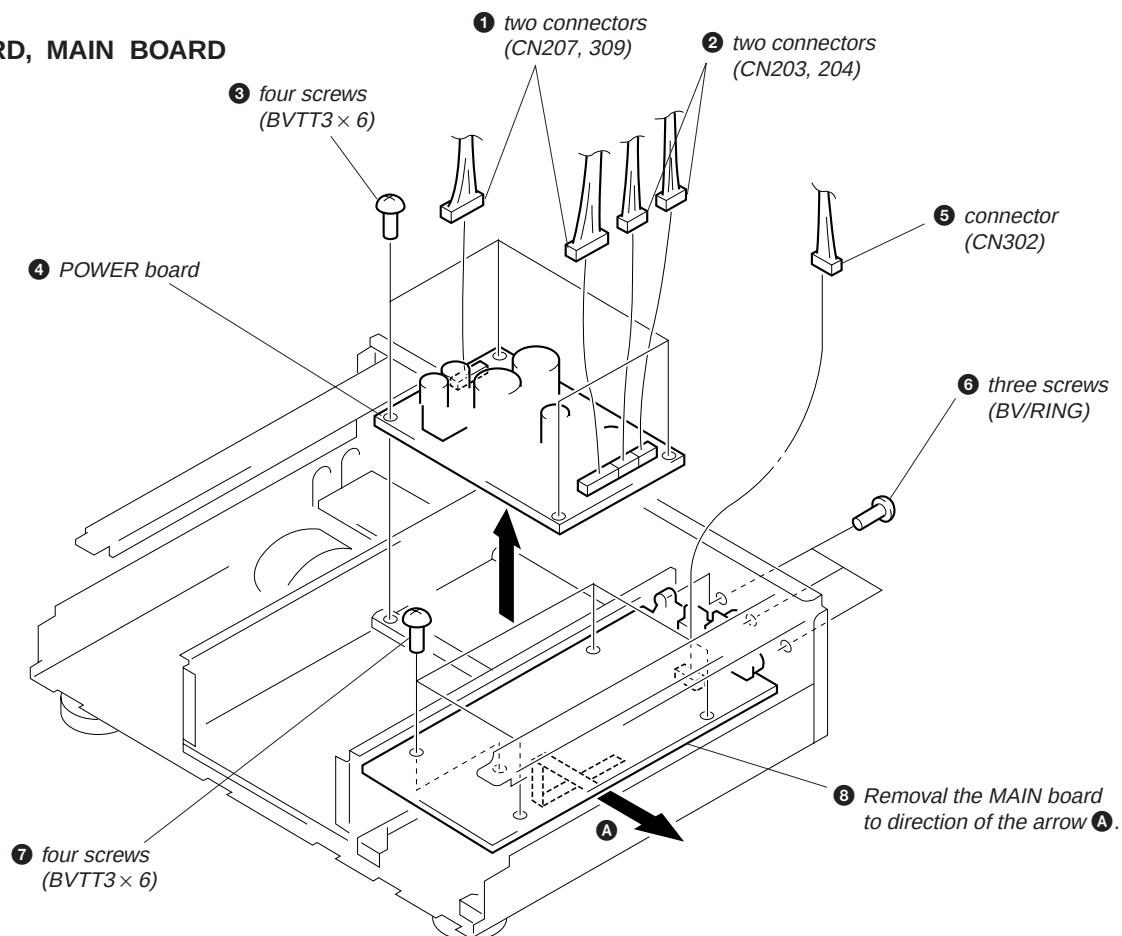
OPTICAL PICK-UP



LOADING MOTOR



POWER BOARD, MAIN BOARD



SECTION 4

TEST MODE

4-1. AF MODE

Connect the TP19 (AFADJ) on the BD board to the ground and turn on the power supply.

The AF mode is then activated and the following check can be made.

4-1-1. Fluorescent Indicator Tube Check

After confirming display of all on, keep pressing the following button, and the following display is attained.

■ (STOP) button



(Display: 01)

► (PLAY) button

(Display: 02)

■ (PAUSE) button

(Display: 03)

▶▶ button

```
SHUFFLE  REPEAT  A-  
          AUTO  SPACE  EDIT  
  
          STEP                                     (Display: 04)
```

◀ button

	1	B	(JUST)
PROGRAM			
	INDEX	PEAK	(Display: 05)

CHECK button

1		3		5
	7		9	
11		13		15

(Display: 06)

CLEAR button

2 4
6 8 10
12 14 ▶
(Di

(Display: 07)

Keep pressing the  button, and all on display is attained again.

4-1-2. Key Check

All buttons are assigned with numbers respectively, and when each button is pressed, it is counted and its number is displayed. Up to “16” can be counted.

A button pressed once is not further counted but the number is displayed. (Table 4-1)

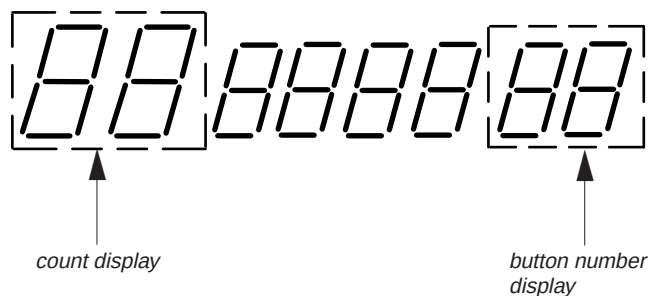


Table 4-1.

Button	Display	Button	Display
ERASE	00	II	03
EDIT/ TIME FADE	12	▶▶	04
FILE	13	◀◀	05
FILTER	20	CHECK	06
ENTER	23	CLEAR	07
▲ OPEN/CLOSE	all light up	P MODE	09
■	01	REPEAT	10
▶	02	TIME	11

4-1-3. Remote Commander Check

Press the  button on remote commander, and “ ° ”  on the set turn on. Nothing will be displayed if pressing another button.

4-2. ADJ MODE

Connect the TP18 (ADJ) on the BD board to the ground and turn on the power supply. The ADJ mode is then activated and the following operation is executed.

- There is no problem even if Guarded Frame Sync is low value continuously during playing.
- Do not perform high speed search during an access. The gain of focus servo and spindle servo does not lower during playing.
- Manual operation and measurement of the servo system are possible. (For detailed operating method, see Table 4-2. in ADJ Mode.)

4-2-1. Button Operation Table in ADJ Mode

After all music numbers are displayed, press the **TIME** button, and the jitter display mode is then set. The button functions are as listed below.

Button Functions (Operate with remote commander.)

Table 4-2.

Button No.	Test Mode
3	Tracking servo off
8	Tracking servo on
11	S-curve measuring mode
12	All servo off
13	Top turnblack display
14	Bottom turnblack display
15	Center display
16	Optimum point display
17	Optimum jitter display
18	TE traverse display
19	VC, FE and RF display
20	Autogain display (Focus, tracking and sled)

* For button numbers 3, 8, 11, and 12, use them only when an oscilloscope is connected.

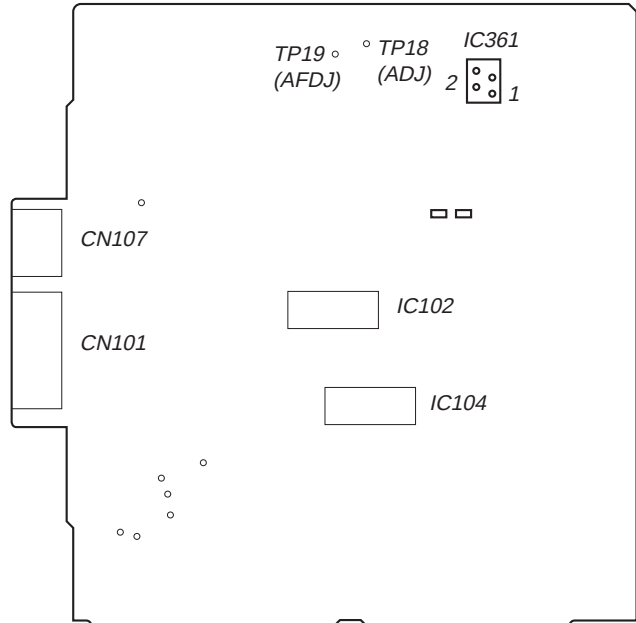
4-3. CLV-S MODE

The spindle servo can be operated for play in the CLV-S mode by connecting TP18 (ADJ) and after turning on the power supply.

4-4. RELEASE THE TEST MODE

Disconnect the lead wire of test point connected in first step.

Connecting Location:
[BD BOARD] (SIDE B)



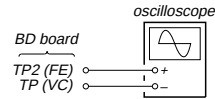
SECTION 5 ELECTRICAL ADJUSTMENTS

Notes:

1. CD block basically constructed to operate without adjustment. Therefore, check each item in order given.
2. Use YEDS-18 disc (Part No.: 3-702-101-01) unless otherwise indicated.
3. Use the oscilloscope with more than 10 MΩ impedance.
4. Clean an object lens by an applicator with neutral detergent when the signal level is low than specified value with the following checks.

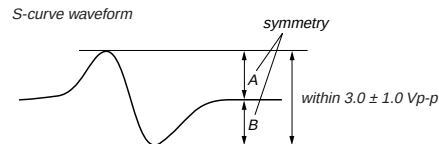
S-Curve Check

Connection:



Procedure:

1. Connect the oscilloscope to TP2 (FE) and TP (VC) on BD board.
2. Connect the TP3 (FEI: IC101 pin ②) and TP (VC) with lead wire.
3. Turned power switch on.
4. Put disc (YEDS-18) in and turned power switch on again and actuate the focus search. (actuate the focus search when disc table is moving in and out.)
5. Confirm that the oscilloscope waveform (S-curve) is symmetrical between A and B. And confirm peak to peak level within 3.0 ± 1.0 Vp-p.



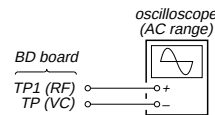
6. After check, remove the lead wire connected in step 2.

Note:

- Try to measure several times to make sure that the ratio of A : B or B : A is more than 10 : 7.
- Take sweep time as long as possible and light up the brightness to obtain best waveform.

RF Level Check

Connection:

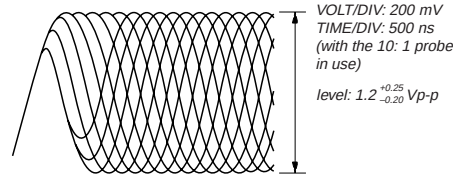


Procedure:

1. Connect the oscilloscope to TP1 (RF) and TP (VC) on BD board.
2. Turned power switch on. (stop mode)
3. Put disc (YEDS-18) in and press the [] button.
4. Confirm that the oscilloscope waveform is clear and check RF signal level is correct or not.

Note: Clear RF signal waveform means that the shape “◇” can be clearly distinguished at the center of the waveform.

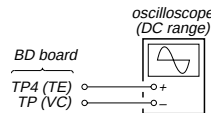
RF signal waveform



When observing the eye pattern, set the oscilloscope for AC range and raise vertical sensitivity.

E-F Balance (Traverse) Check

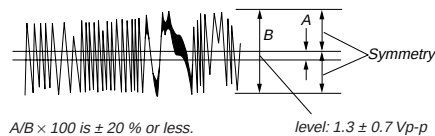
Connection:



Procedure:

1. Connect the TP18 (ADJ) to ground and TP5 (TEI: IC101 pin ②) to TP (VC) with lead wire.
2. Connect the oscilloscope to TP4 (TE) and TP (VC) on BD board.
3. Turned power switch on.
4. Put disc (YEDS-18) in and press the [] button.
5. Confirm that the oscilloscope waveform is symmetrical on the top and bottom in relation to A Vdc, and check this level.

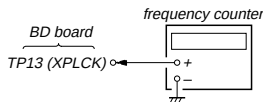
Traverse waveform



6. After check, remove the lead wire connected in step 1.

RF PLL Free-run Frequency Check

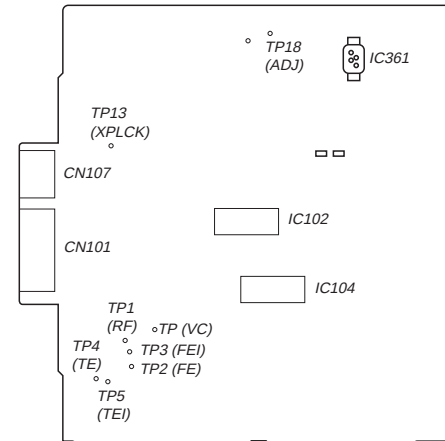
Connection:



Procedure:

1. Connect the frequency counter to TP13 (XPLCK).
2. Turned power switch on.
3. Put disc (YEDS-18) in and press the [] button.
4. Confirm that the reading on frequency counter is 4.3218 MHz.

Connecting Location: [BD BOARD] (SIDE B)



SECTION 6 DIAGRAMS

6-1. IC PIN FUNCTION DISCRIPTION

- BD BOARD IC101 CXD2545Q
(DIGITAL SIGNAL PROCESSOR, FOCUS/TRACKING/SLED SERVO, EFM COMPARATOR)

Pin No.	Pin Name	I/O	Function
1	SRON	O	Sled servo drive PWM signal output terminal Not used (open)
2	SRDR	O	Sled servo drive PWM signal (–) output to the BA6297AFP (IC102)
3	SFON	O	Sled servo drive PWM signal output terminal Not used (open)
4	TFDR	O	Tracking servo drive PWM signal (–) output to the BA6297AFP (IC102)
5	TRON	O	Tracking servo drive PWM signal output terminal Not used (open)
6	TRDR	O	Tracking servo drive PWM signal (+) output to the BA6297AFP (IC102)
7	TFON	O	Tracking servo drive PWM signal output terminal Not used (open)
8	FFDR	O	Focus servo drive PWM signal (+) output to the BA6297AFP (IC102)
9	FRON	O	Focus servo drive PWM signal output terminal Not used (open)
10	FRDR	O	Focus servo drive PWM signal (–) output to the BA6297AFP (IC102)
11	FFON	O	Focus servo drive PWM signal output terminal Not used (open)
12	VCOO	O	Oscillator circuit output terminal for analog PLL of the playback EFM Not used (open)
13	VOI	I	Oscillator circuit input terminal for analog PLL of the playback EFM Not used (fixed at “L”)
14	TEST	I	Input terminal for the test (fixed at “L”)
15	DVSS	—	Ground terminal (digital system)
16	TES2	I	Input terminal for the test (fixed at “L”)
17	TES3	I	Input terminal for the test (fixed at “L”)
18	PDO	O	Charge-pump output terminal for analog PLL of the playback EFM Not used (open)
19	VPCO	O	PLL charge-pump output terminal for the variable pitch Not used (open)
20	VCKI	I	Clock signal input from external VCO for the variable pitch Not used (fixed at “L”)
21	AVD2	—	Power supply terminal (+5V) (analog system)
22	IGEN	I	Power supply terminal (+5V) (for operational amplifier)
23	AVS2	—	Ground terminal (analog system)
24	ADII	I	Input terminal for the A/D converter Not used (open)
25	ADIO	O	Output terminal of the operational amplifier Not used (open)
26	RFDC	I	RF signal (DC level) input terminal for the digital servo process
27	TE	I	Tracking error signal input from the RF amplifier in optical pick-up
28	SE	I	Sled error signal input from the RF amplifier in optical pick-up
29	FE	I	Focus error signal input from the RF amplifier in optical pick-up
30	VC	I	Middle point voltage (+2.5V) input from the RF amplifier in optical pick-up
31	FILO	O	Filter output terminal for master clock of the playback master PLL
32	FILI	I	Filter input terminal for master clock of the playback master PLL
33	PCO	O	Phase comparison output terminal for master clock of the playback EFM master PLL
34	CLTV	I	Internal VCO control voltage input of the playback master PLL
35	AVS1	—	Ground terminal (analog system)
36	RFAC	I	RF signal (AC level) input terminal for the EFM demodulator
37	BIAS	I	Constant current input terminal of the playback EFM asymmetry circuit
38	ASYI	I	Playback EFM asymmetry comparator voltage input terminal
39	ASYO	O	Playback EFM full-swing output terminal
40	AVD1	—	Power supply terminal (+5V) (analog system)
41	DVDD	—	Power supply terminal (+5V) (digital system)
42	ASYE	I	Playback EFM asymmetry circuit on/off selection input terminal (fixed at “H”)
43	PSSL	I	Audio data output mode selection input terminal (fixed at “L”)

Pin No.	Pin Name	I/O	Function
44	WDCK	O	Word clock signal (88.2 kHz) output terminal Not used (open)
45	LRCK	O	L/R sampling clock signal (44.1 kHz) output to the CXD8595Q (IC301)
46	DATA	O	DA16 output when PSSL=“H”, 48-bit slot serial data output when PSSL=“L” (PSSL (pin 43)=fixed at “L”) Serial data output to the CXD8595Q (IC301)
47	BCLK	O	DA15 output when PSSL=“H”, 48-bit slot bit clock signal output when PSSL=“L” (PSSL (pin 43)=fixed at “L”) Bit clock signal (2.8224 MHz) output to the CXD8595Q (IC301)
48	64 DATA	O	DA14 output when PSSL=“H”, 64-bit slot serial data output when PSSL=“L” (PSSL (pin 43)=fixed at “L”) Not used (open)
49	64 BCLK	O	DA13 output when PSSL=“H”, 64-bit slot bit clock signal output when PSSL=“L” (PSSL (pin 43)=fixed at “L”) Not used (open)
50	64 LRCK	O	DA12 output when PSSL=“H”, 64-bit slot L/R sampling clock signal output when PSSL=“L” (PSSL (pin 43)=fixed at “L”) Not used (open)
51	GTOP	O	DA11 output when PSSL=“H”, GTOP signal output when PSSL=“L” (PSSL (pin 43)=fixed at “L”) Not used (open)
52	XUGF	O	DA10 output when PSSL=“H”, XUGF signal output when PSSL=“L” (PSSL (pin 43)=fixed at “L”) Not used (open)
53	XPLCK	O	DA09 output when PSSL=“H”, XPLCK signal output when PSSL=“L” (PSSL (pin 43)=fixed at “L”) Not used (open)
54	GFS	O	DA08 output when PSSL=“H”, GFS (guard frame sync) signal output when PSSL=“L” (PSSL (pin 43)=fixed at “L”) Not used (open)
55	RFCK	O	DA07 output when PSSL=“H”, RFCK (read frame clock) signal output when PSSL=“L” (PSSL (pin 43)=fixed at “L”) Not used (open)
56	C2PO	O	DA06 output when PSSL=“H”, C2PO signal output when PSSL=“L” (PSSL (pin 43)=fixed at “L”) Not used (open)
57	XRAOF	O	DA05 output when PSSL=“H”, XRAOF (RAM over flow) signal output when PSSL=“L” (PSSL (pin 43)=fixed at “L”) Not used (open)
58	MNT3	O	DA04 output when PSSL=“H”, MNT3 (monitor 3) signal output when PSSL=“L” (PSSL (pin 43)=fixed at “L”) Not used (open)
59	MNT2	O	DA03 output when PSSL=“H”, MNT2 (monitor 2) signal output when PSSL=“L” (PSSL (pin 43)=fixed at “L”) Not used (open)
60	MNT1	O	DA02 output when PSSL=“H”, MNT1 (monitor 1) signal output when PSSL=“L” (PSSL (pin 43)=fixed at “L”) Not used (open)
61	MNT0	O	DA01 output when PSSL=“H”, MNT0 (monitor 0) signal output when PSSL=“L” (PSSL (pin 43)=fixed at “L”) Not used (open)
62	XTAI	I	System clock input terminal (16 MHz)
63	XTAO	O	System clock output terminal (16 MHz) Not used (open)
64	XTSL	I	System clock selection input terminal (fixed at “L”)
65	DVSS	—	Ground terminal (digital system)
66	FSTI	I	2/3 divider input terminal of pins 62 (XATI) and 63 (XTAO)
67	FSTO	O	2/3 divider output terminal of pins 62 (XATI) and 63 (XTAO)
68	C4M	O	4.2336 MHz clock signal output terminal Not used (open)
69	C16M	O	16.9344 MHz clock signal output terminal Not used (open)
70	MD2	I	Digital out on/off control signal input from the system controller (IC351)
71	DOUT	O	Digital signal (for coaxial out and optical out) output terminal
72	EMPH	O	Emphasis control signal output terminal Not used (open)
73	WFCK	O	Write frame clock signal output terminal Not used (open)
74	SCOR	O	Sub-code sync (S0+S1) detection signal output to the system controller (IC351)

Pin No.	Pin Name	I/O	Function
75	SBSO	O	Sub-code P-W serial data output terminal Not used (open)
76	EXCK	I	Sub-code P-W serial data reading clock signal input terminal Not used (fixed at “L”)
77	SUBQ	O	Sub-code Q data signal output to the system controller (IC351)
78	SQCK	I	Sub-code Q data reading clock signal input from the system controller (IC351)
79	MUTE	I	Mute signal input from the system controller (IC351)
80	SENS	O	Internal status (SENSE) signal output to the system controller (IC351)
81	$\overline{\text{XRST}}$	I	System reset signal input from the reset signal generator (IC206) “L”: reset For several hundreds msec. after the power supply rises, “L” is input, then it changes to “H”
82	DIRC	I	1-track jump mode input terminal Not used (fixed at “H”)
83	SCLK	I	Sense serial data reading clock signal input from the system controller (IC201)
84	DFSW	I	Defect on/off select signal input terminal Not used (fixed at “L”)
85	ATSK	I	Input terminal for the anti-shock Not used (fixed at “L”)
86	DATA	I	Serial data input from the system controller (IC351)
87	XLAT	I	Serial data latch pulse signal input from the system controller (IC351)
88	CLOK	I	Serial data transfer clock signal input from the system controller (IC351)
89	COUT	O	Track number count signal output terminal Not used (open)
90	DVDD	—	Power supply terminal (+5V) (digital system)
91	MIRR	O	Mirror detection signal output terminal Not used (open)
92	DFCT	O	Defect signal output terminal Not used (open)
93	FOK	O	Focus OK signal output terminal Not used (open)
94	FSW	O	Selection signal output terminal of the output filter for spindle motor Not used (open)
95	MON	O	Spindle motor on/off control signal output terminal Not used (open)
96	MDP	O	Spindle servo control signal output terminal
97	MDS	O	Spindle servo control signal output terminal Not used (open)
98	LOCK	O	GFS is sampled by 460 Hz “H” output when GFS is “H” Not used (open)
99	SSTP	I	Detection input from the sled limit-in detect switch (SW102) The optical pick-up is inner position when “H”
100	SFDR	O	Sled servo drive PWM signal (+) output to the BA6297AFP (IC102)

• BD BOARD IC351 CXP84124-068Q (SYSTEM CONTROL)

Pin No.	Pin Name	I/O	Function
1	A3	O	Address signal output to the static RAM (IC352)
2	A4	O	
3	A5	O	
4	A6	O	
5	A7	O	
6	A8	O	
7	A9	O	
8	A10	O	
9	A11	O	
10	A12	O	
11	WE	O	Write enable signal output to the static RAM (IC352)
12	NC	O	Not used (open)
13	NC	O	Not used (open)
14	LED-PLAY	O	▶ LED (D871) drive signal output terminal “H”: LED on
15	LED-PAUSE	O	▮ LED (D872) drive signal output terminal “H”: LED on
16	LED-FILTER	O	FILTER LED (D873) drive signal output terminal “H”: LED on
17	SPDL-MUTE	O	Mute signal output to the spindle motor driver (IC102, 104)
18	SHIFT-ON/OFF	O	Reset signal output to the CXD2562Q-CS (IC302) “L”: reset
19	VOL UP	O	Volume up control signal output to the volume control motor driver (IC354)
20	VOL DOWN	O	Volume down control signal output to the volume control motor driver (IC354)
21	BLANK	O	Blank signal output to the fluorescent indicator tube driver (IC801 to IC803)
22	FL D0	O	Serial data output to the fluorescent indicator tube driver (IC803)
23	FL D1	O	Serial data output to the fluorescent indicator tube driver (IC802)
24	FL D2	O	Serial data output to the fluorescent indicator tube driver (IC801)
25	FL CLK	O	Serial data transfer clock signal output to the fluorescent indicator tube driver (IC801 to IC803)
26	FL WR	O	Read/write select signal output to the fluorescent indicator tube driver (IC801 to IC803)
27	SENSE SW	O	On/off control signal output to the stabilizer detect sensor (IC361) “H”: on
28	SENSE	I	Detect signal input from the stabilizer detect sensor (IC361) “H”: on
29	LIMIT OUT	I	Detection input from the sled limit-out detect switch The optical pick-up is outer position when “L” Not used (fixed at “L”)
30	RESET	I	System reset signal input from the reset signal generator (IC206) “L”: reset For several hundreds msec. after the power supply rises, “L” is input, then it changes to “H”
31	XTALI	I	Main system clock input terminal (4 MHz)
32	XTALO	O	Main system clock output terminal (4 MHz)
33	VSS	—	Ground terminal
34	TX	O	Sub system clock output terminal Not used (open)
35	TEX	I	Sub system clock input terminal Not used (fixed at “L”)
36	AVSS	—	Ground terminal (for A/D converter)
37	AVREF	I	Reference voltage input terminal (+5V)
38	ADJ/AFADJ	I	Setting terminal for the test mode “L” active
39	K0	I	Key input terminal (A/D input) (fixed at “H”)
40	K1	I	Key input terminal (A/D input) P MODE, TIME keys (S819S820) input
41	K2	I	Key input terminal (A/D input) ERASE, CHECK, CLEAR, FILTER, ◀◀, ▶▶, keys (S801 to S806) input

Pin No.	Pin Name	I/O	Function
42	K3	I	Key input terminal (A/D input) EDIT/TIME FADE, REPEAT, FILE, OPEN/CLOSE, , keys (S811 to S817) input
43	K4	I	Rotary encoder input terminal (A/D input) AMS key (RV801) input
44	K5	I	Rotary encoder input terminal (A/D input) AMS key (RV801) input
45	IN/OUT SW	I	Detection input from the loading in/out detect switch (S281, S282) (A/D input)
46	SCLK	O	Sense serial data reading clock signal output to the CXD2545Q (IC101)
47	PRGL	O	Serial data latch pulse signal output to the CXD8595Q (IC301)
48	CLK	O	Serial data transfer clock signal output to the CXD2545Q (IC101) and CXD8595Q (IC301)
49	SENSE	I	Internal status (SENSE) signal input from the CXD2545Q (IC101)
50	DATA	O	Serial data output to the CXD2545Q (IC101) and CXD8595Q (IC301)
51	SQCK	O	Sub-code Q data reading clock signal output to the CXD2545Q (IC101)
52	SUBQ	I	Sub-code Q data signal input from the CXD2545Q (IC101)
53	TEST	O	Output terminal for the test Not used (open)
54	SEL1	I	Destination setting terminal (fixed at “L”)
55	SEL0	I	Destination setting terminal (fixed at “L”)
56	RMIN	I	Remote control signal input from the remote control receiver (IC804)
57	TIMER	I	Timer control input terminal Not used (fixed at “H”)
58	TEST	O	Output terminal for the test Not used (open)
59	TEST	O	Output terminal for the test Not used (open)
60	SCOR	I	Sub-code sync (S0+S1) detection signal input from the CXD2545Q (IC101)
61	AMUTE	O	Muting control signal output to the analog mute driver and mute relay driver
62	LDON	O	Laser diode on/off selection signal output to the RF amplifier in optical pick-up
63	XLT	O	Serial data latch pulse signal output to the CXD2545Q (IC101)
64	LOAD OUT	O	Loading motor (M2) drive signal output to the NJM4558 (IC182) *1
65	LOAD IN	O	Loading motor (M2) drive signal output to the NJM4558 (IC182) *1
66	DOUT	O	Digital out on/off control signal output to the CXD2545Q (IC101) Not used (Open)
67	DMUTE	O	Muting control signal output to the CXD2545Q (IC101) and CXD8595Q (IC301)
68	D0	I/O	Two-way data bus with the static RAM (IC352)
69	D1	I/O	
70	D2	I/O	
71	D3	I/O	
72	VDD	—	Power supply terminal (+5V)
73	NC	I	Not used (fixed at “H”)
74	D4	I/O	Two-way data bus with the static RAM (IC352)
75	D5	I/O	
76	D6	I/O	
77	D7	I/O	
78	A0	O	Address signal output to the static RAM (IC352)
79	A1	O	
80	A2	O	

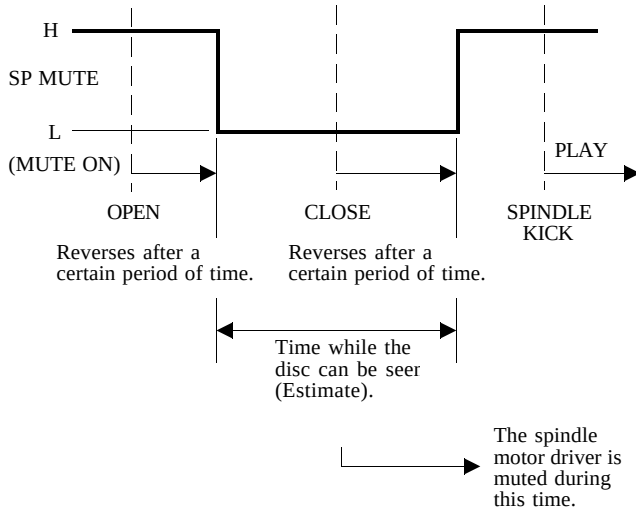
*1 Loading motor (M2) control

Operation Terminal	OFF	OUT	I N	BRAKE
LOAD OUT (pin 64)	“L”	“H”	“L”	“H”
LOAD IN (pin 65)	“L”	“L”	“H”	“H”

• Main Ports

SPDL-MUTE (pin ⑰)

From the viewpoint of performance of the set, the disc must not move nor sway when the disc table opens. These problems however occur in the actual case due to the offset voltage generated and the voltage generated because of the positional relation between the BSL coil and Hall element. The spindle motor driver (IC102, IC104) is therefore muted while the tray is open. Pin ⑰ provides the timing for this.

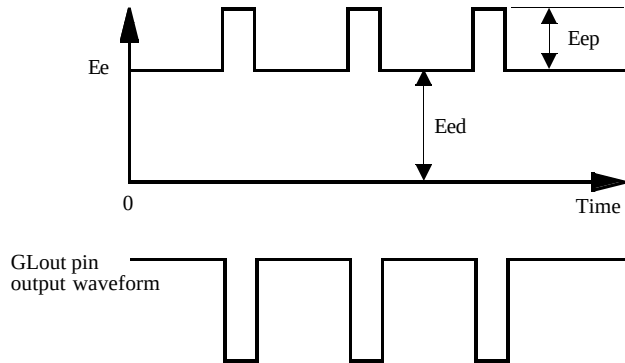


BLANK (pin ⑳)

This port is required because the display tube in this set static lights up and a dedicated screwdriver is required. It is basically a RESET pin. But as problems will occur if used also as RESET, timings are specially provided using the micro-processor.

SENSE SW (pin ㉓)

As IC361 IS471F operate in pulse as shown in the figure, the sound quality may be affected if operated constantly. As the purpose of IC361 is to detect if the presence of the stabilizer, it should be operated only when the tray is drawn in. IC361 operates as it is "H" only at this time. Normally it is "L".



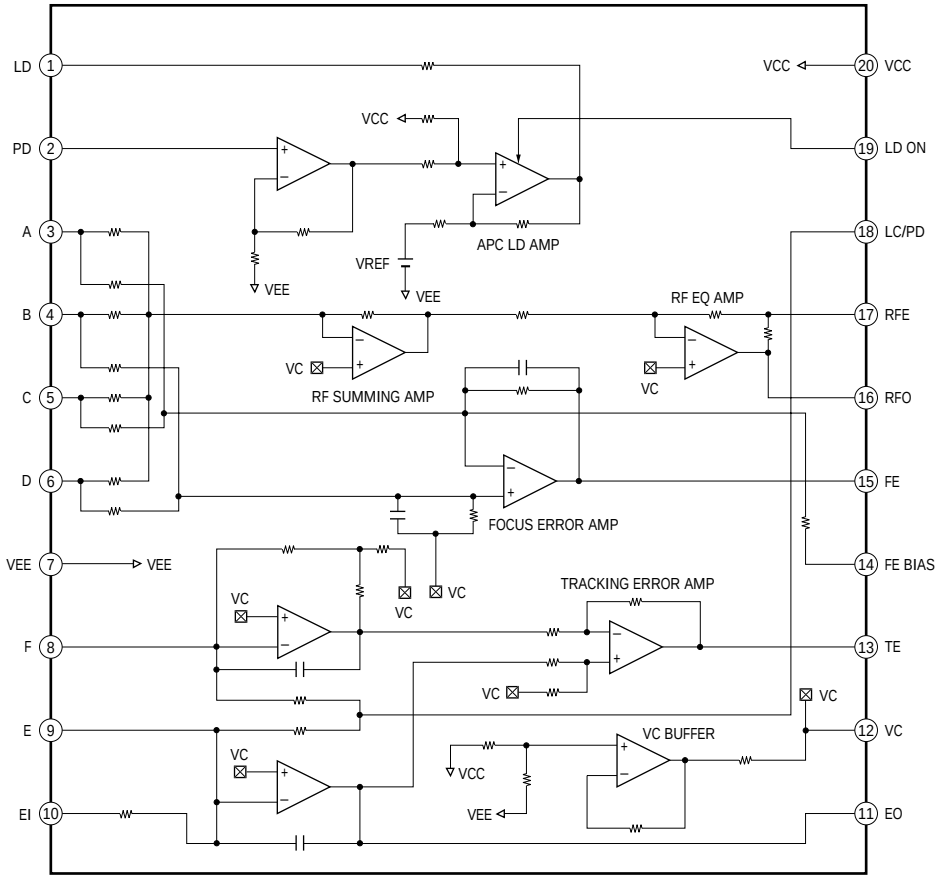
* Eep is the luminance of the signal light tuned with the low level timing of the GLout pin output.
Eed is the luminance of the D.C. light. The light source is the infrared-emitting diode ($\lambda_p=940$ nm).

SENSE (pin ㉔)

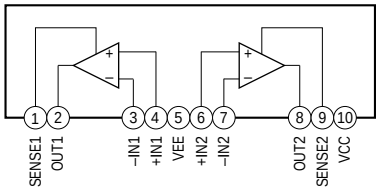
The results of the detection of IC361 IS471F is output to this pin. It becomes "L" when there is no stabilizer (when light reaches). The next process of imposing the next focus is not performed. (Effective only when pin ㉓ is "H".)
Therefore, it must be noted that if PLAY is performed when the servo board at the top of the CDM is not assembled properly, the detection circuit operates and this pin does not operate. It does not operate, refer to 1. "SERVICING NOTES" Preparations for Adjustment and Measurement" on page 3.

• IC Block Diagrams
– BD Section –

IC103 CXA1821M

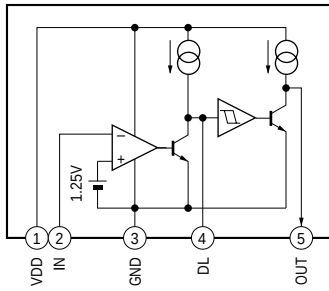


IC181 TA7256P

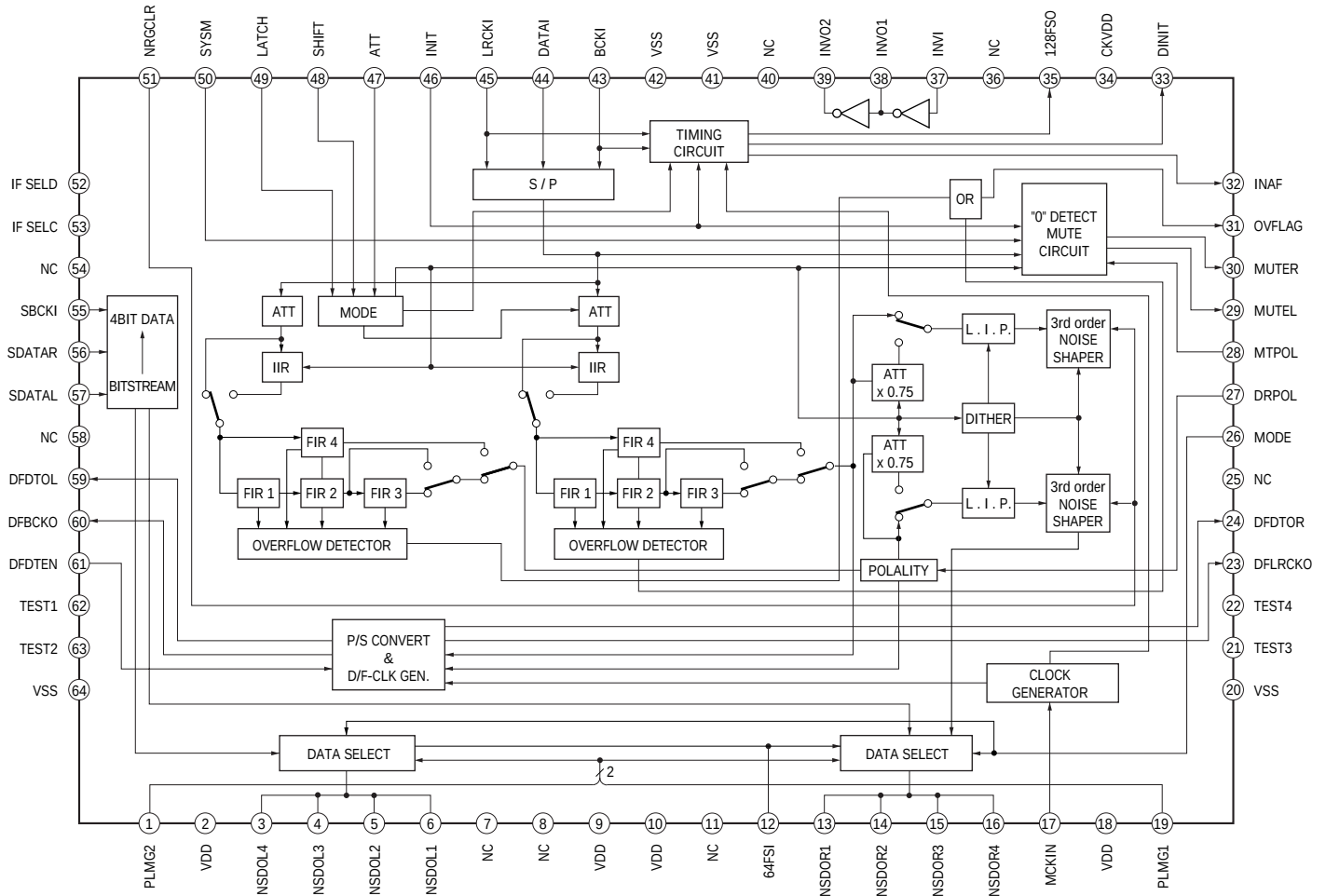


– MAIN Section –

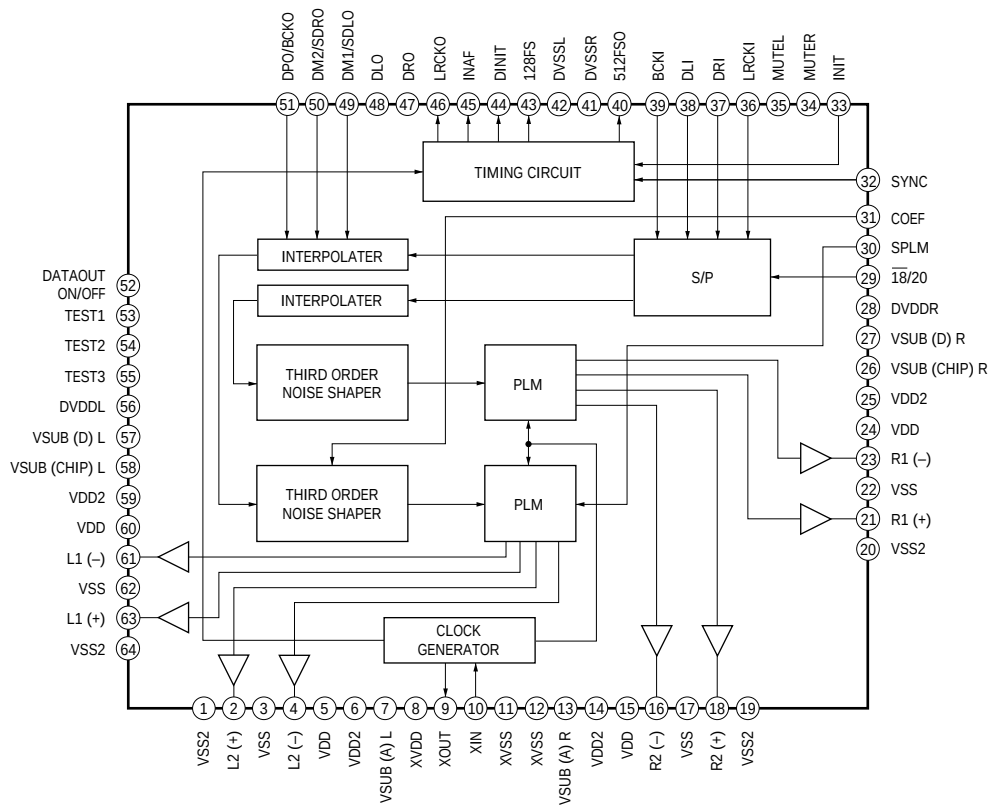
IC206 M51957AL



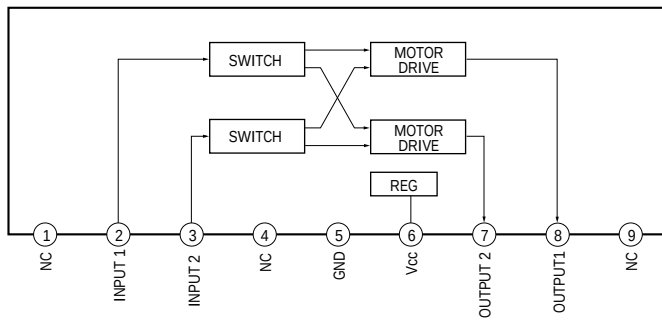
IC301 CXD8595Q



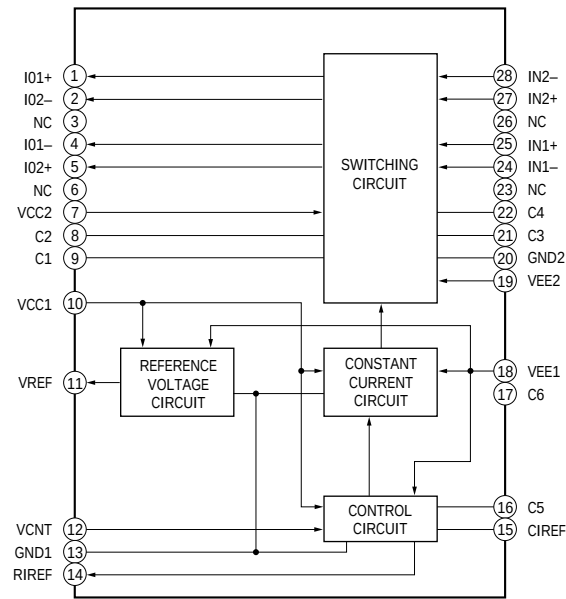
IC302 CXD2562Q



IC354 BA6208

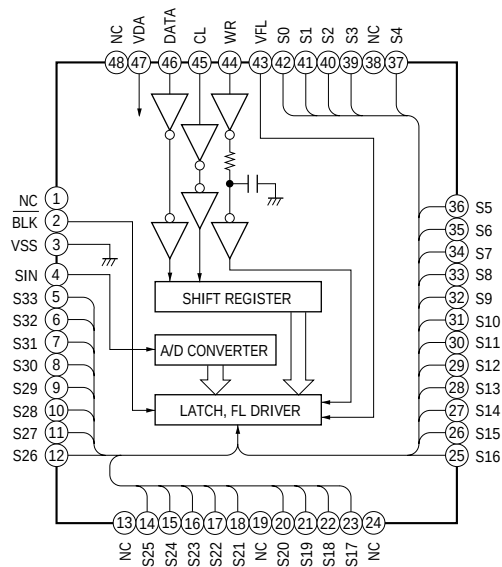


IC501, 601 CXA8042AS



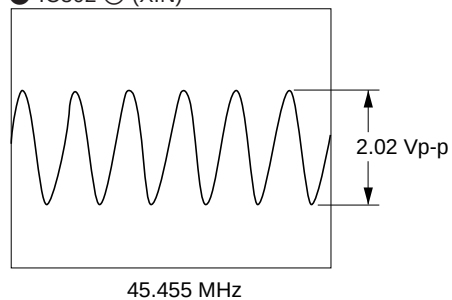
- PANEL Section -

IC801, 802, 803 LC7570E

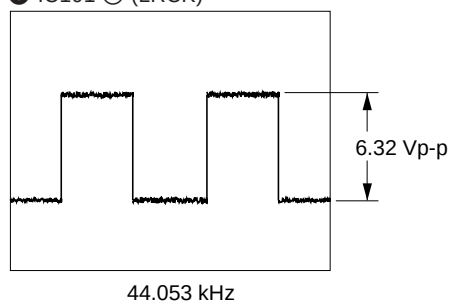


• Wave forms
– MAIN BOARD –

① IC302 ⑩ (XIN)

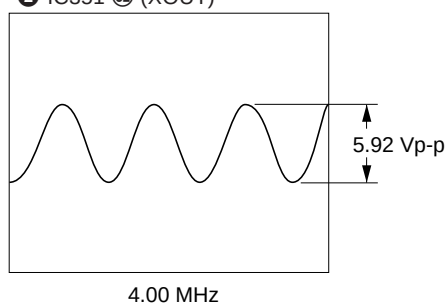


⑥ IC101 ④⑤ (LRCK)

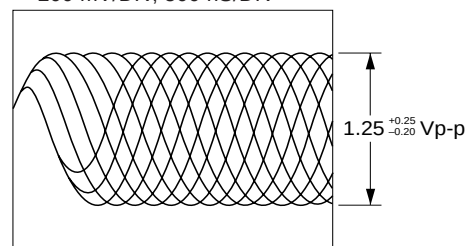


– BD BOARD –

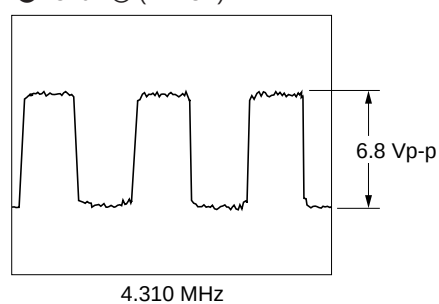
② IC351 ③② (XOUT)



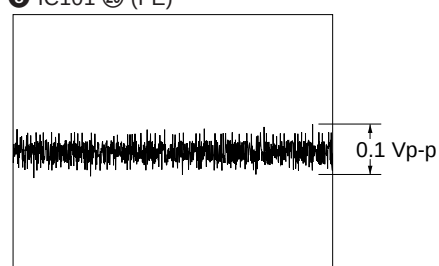
⑦ IC101 ③⑥ (RFAC)
200 mV/DIV, 500 nS/DIV



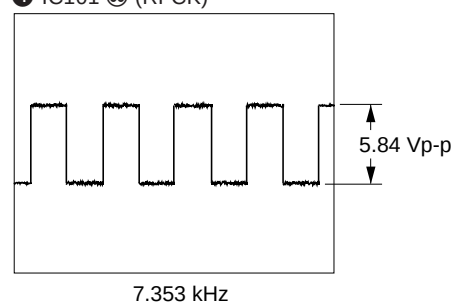
③ IC101 ⑤③ (XPLCK)



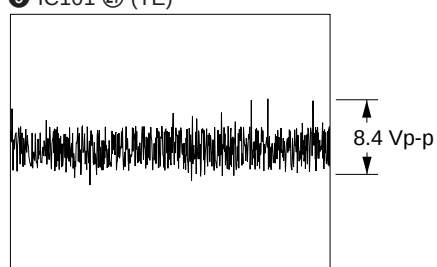
⑧ IC101 ②⑨ (FE)



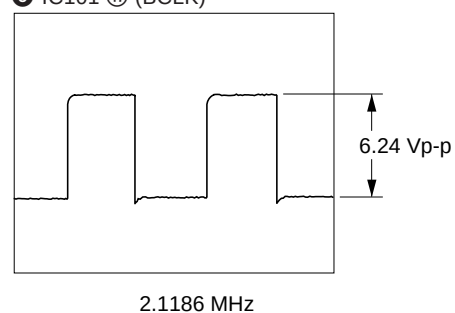
④ IC101 ⑤⑤ (RFCK)



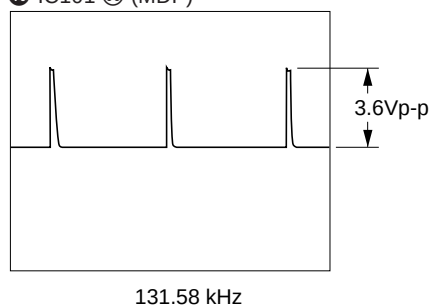
⑨ IC101 ②⑦ (TE)



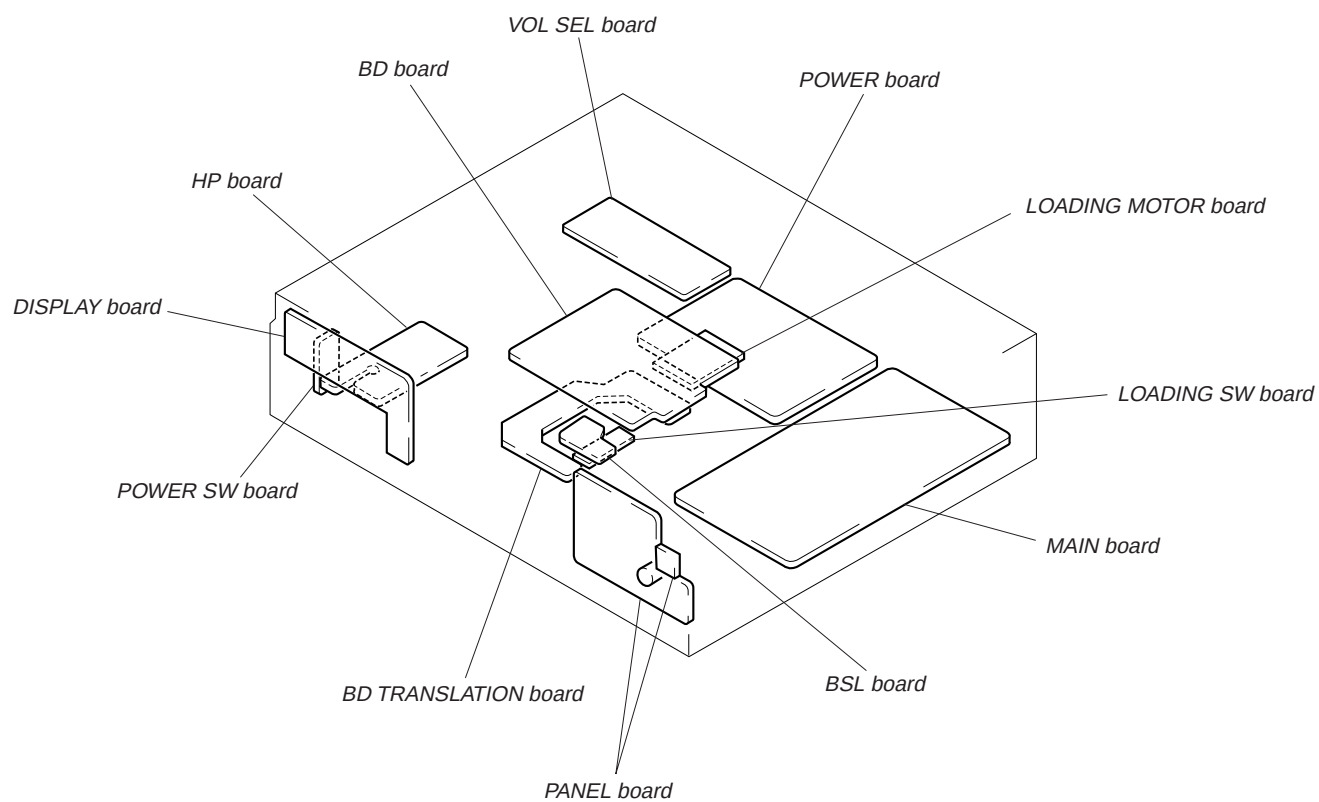
⑤ IC101 ④⑦ (BCLK)



⑩ IC101 ④⑥ (MDP)

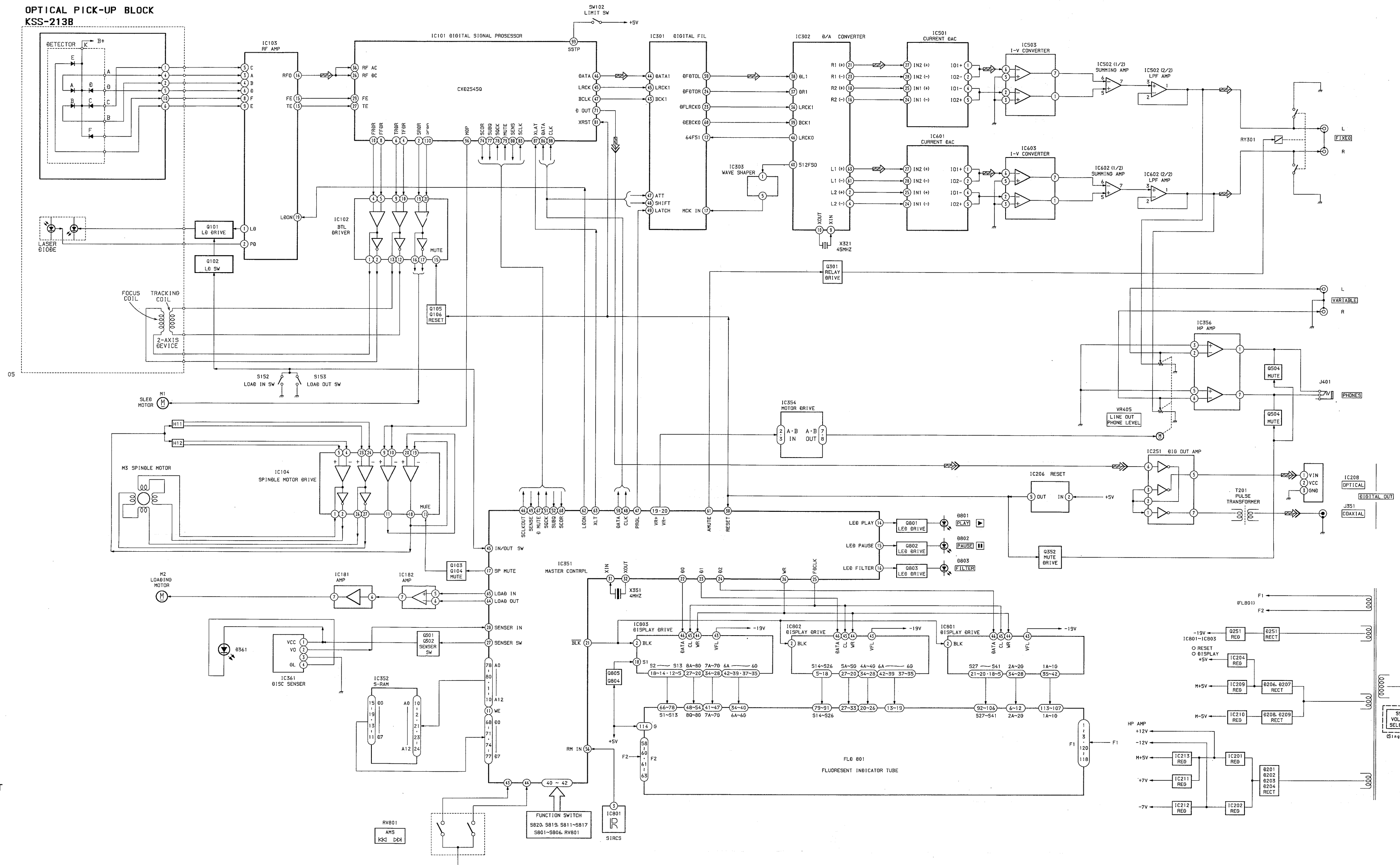


• **Circuit Boards Location**



6-2. BLOCK DIAGRAM

OPTICAL PICK-UP BLOCK
KSS-213B



6-3. PRINTED WIRING BOARDS – BD Section –
• See page 34 for Circuit Boards Location.

• Semiconductor Location

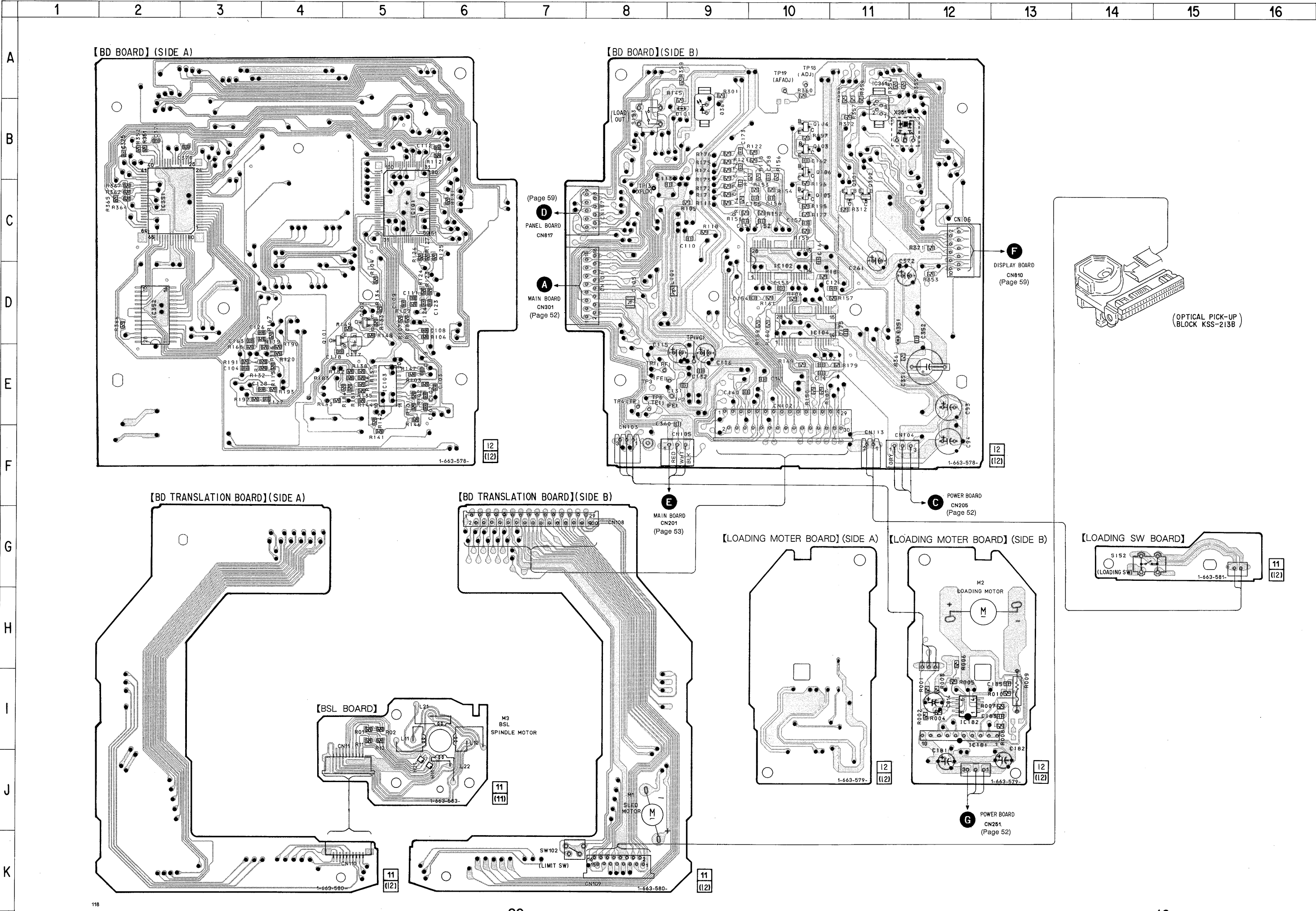
Ref. No.	Location
D101	B-9
D351	D-11
D361	B-9
IC101	C-5
IC102	C-10
IC103	E-5
IC104	D-10
IC181	I-12
IC182	I-12
IC351	C-2
IC352	D-2
IC361	B-11
Q101	D-4
Q102	D-5
Q103	B-10
Q104	B-10
Q105	C-10
Q106	B-10
Q301	C-11
Q302	C-11

Note on Printed Wiring Board:

- : parts extracted from the component side.
- : parts extracted from the conductor side.
- : Through hole.
- Δ : internal component.
- : Pattern from the side which enables seeing.

(The other layers' patterns are not indicated.)

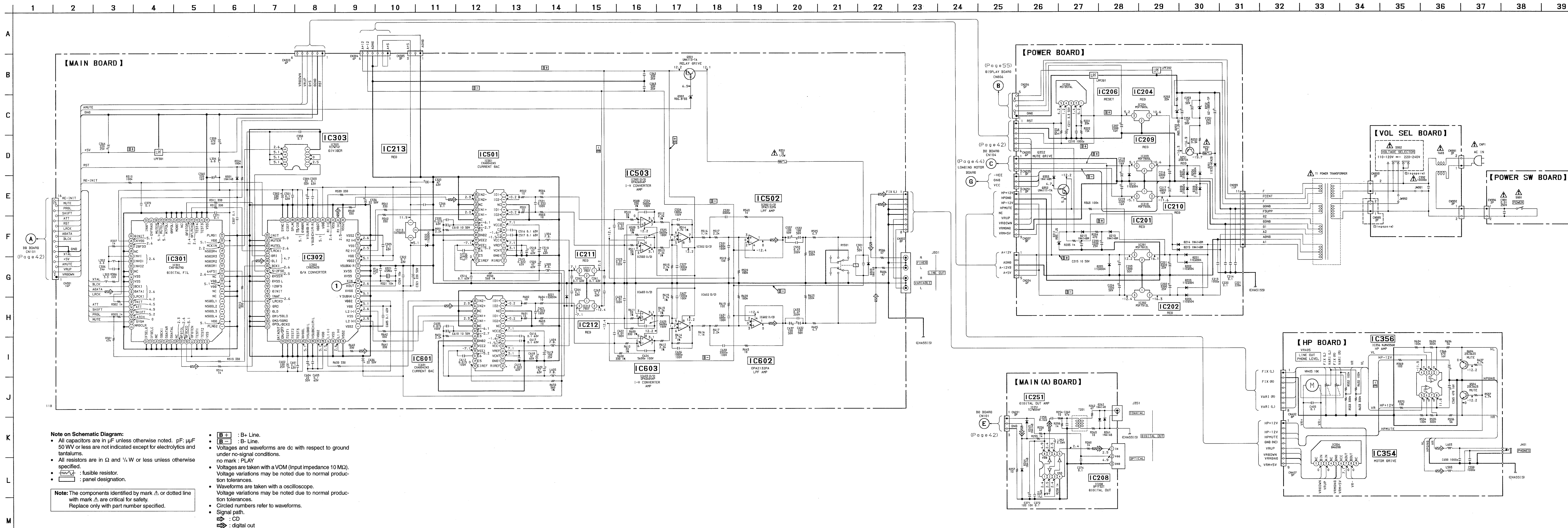
Caution:
Pattern face side: Parts on the pattern face side seen from the pattern face are indicated.
(Side B)
Parts face side: Parts on the parts face side seen from the parts face are indicated.
(Side A)

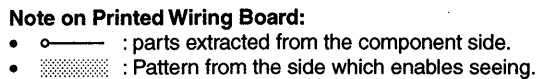


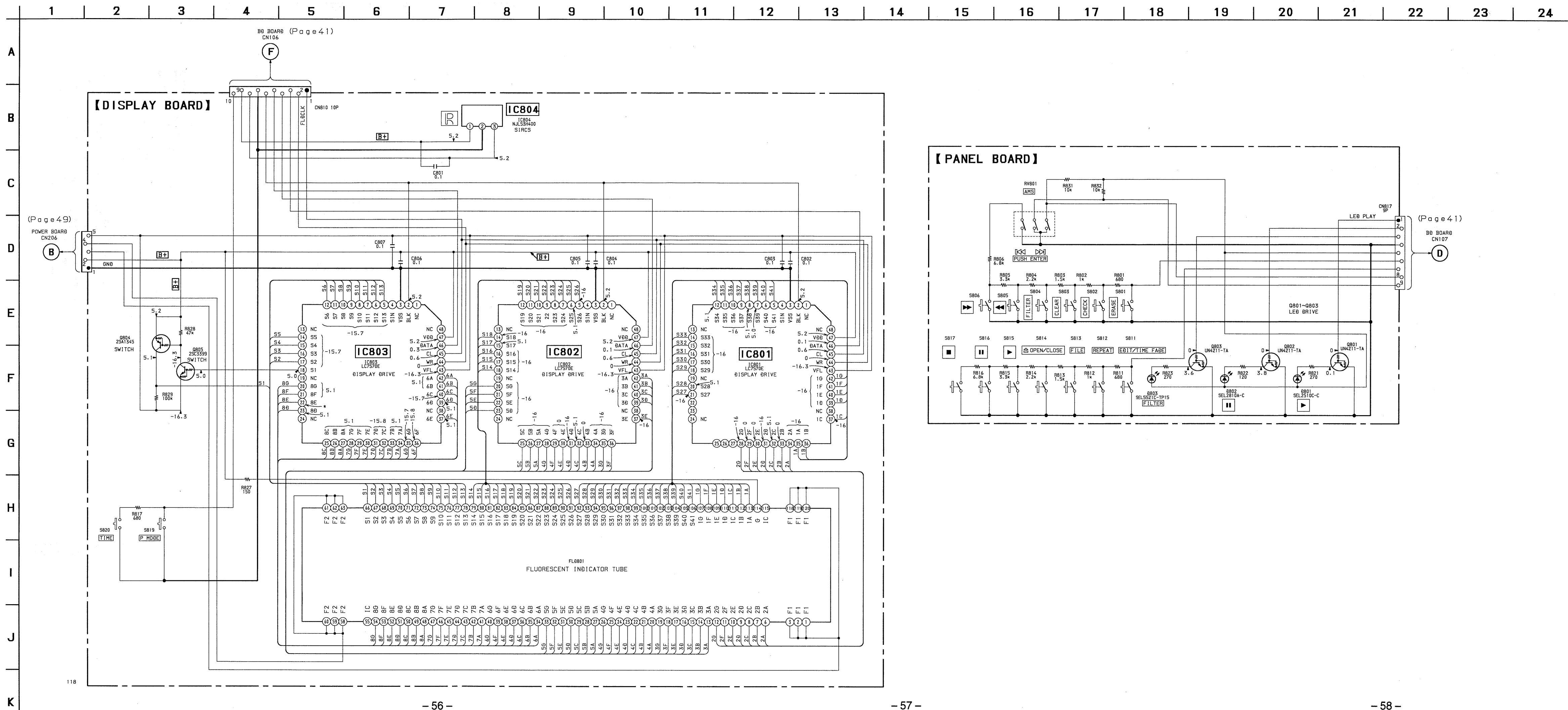


6-5. SCHEMATIC DIAGRAM – MAIN Section –

• See page 30–32 for IC Block Diagrams. • See page 33 for Waveforms.



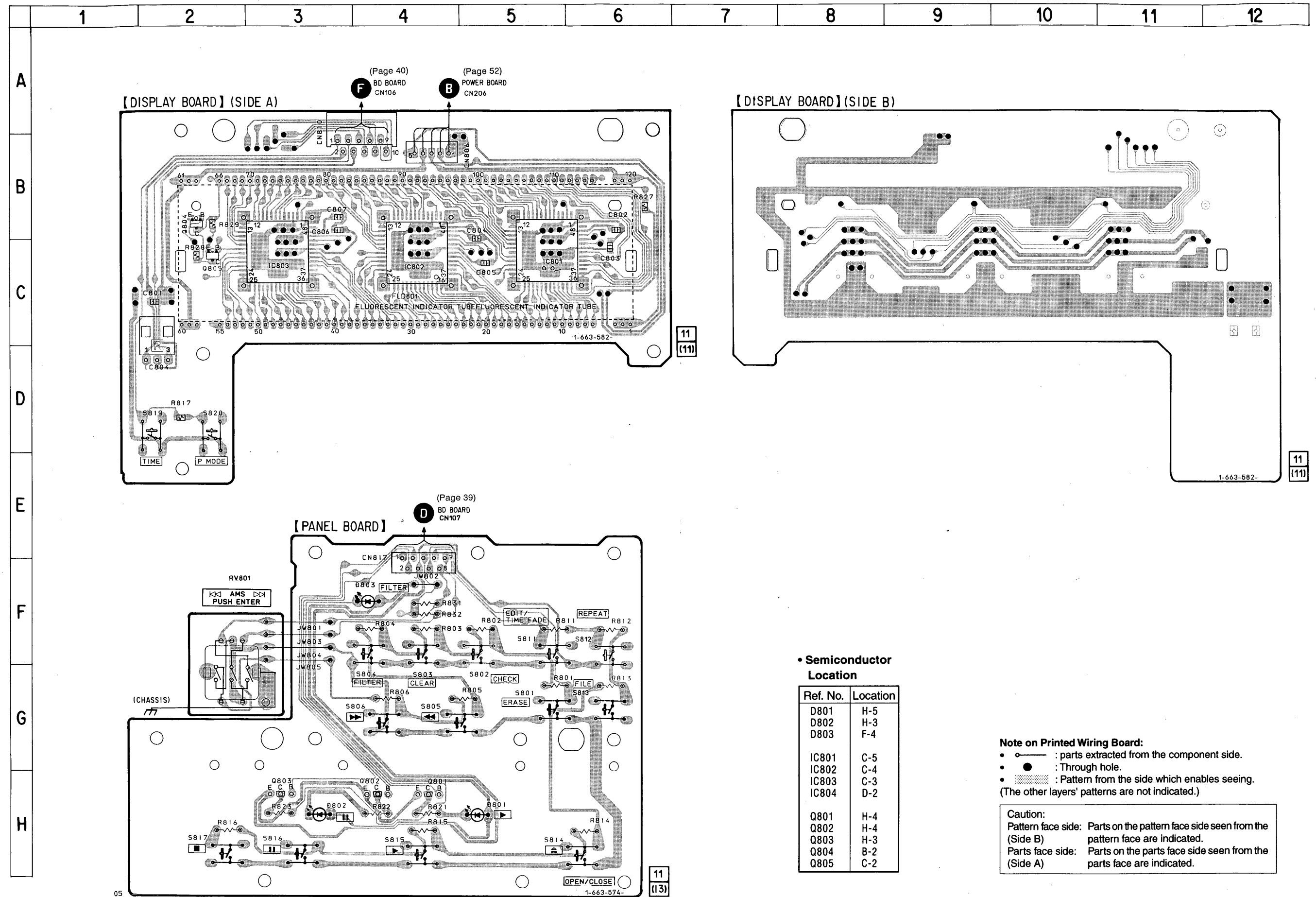




Note on Schematic Diagram:

- All capacitors are in μF unless otherwise noted. pF : μF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $\frac{1}{4} \text{ W}$ or less unless otherwise specified.
-  : panel designation.
-  : B+ Line.
-  : B- Line.
- Voltages are dc with respect to ground under no-signal conditions.
no mark : PLAY
- Voltages are taken with a VOM (Input impedance 10 M Ω).
Voltage variations may be noted due to normal production tolerances.

6-8. PRINTED WIRING BOARDS – PANEL Section – • See page 34 for Circuit Boards Location.



SECTION 7 EXPLODED VIEWS

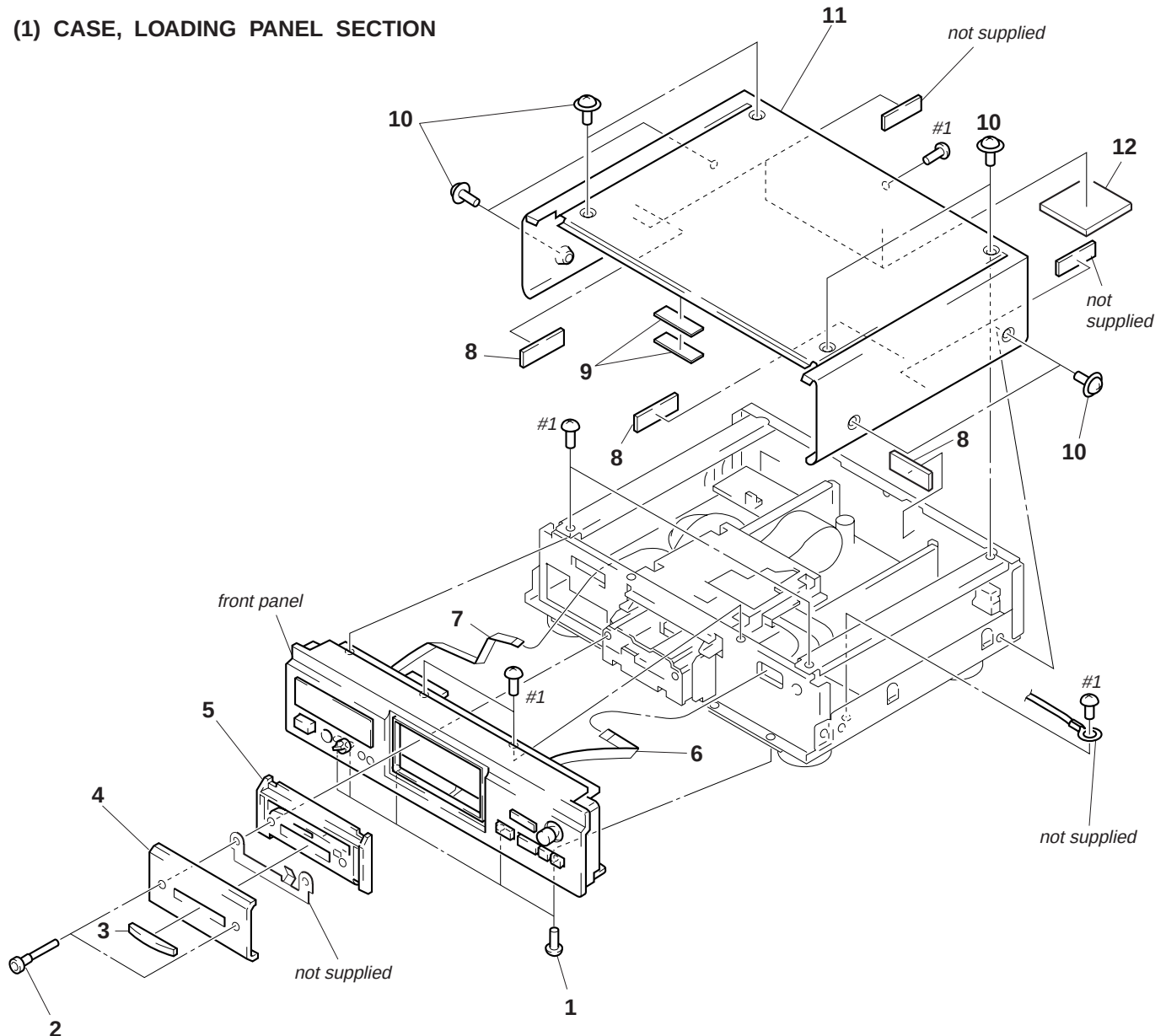
NOTE:

- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Color Indication of Appearance Parts
Example:
KNOB, BALANCE (WHITE)
↑
Cabinet's Color

- Items marked “*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of the electrical parts list.

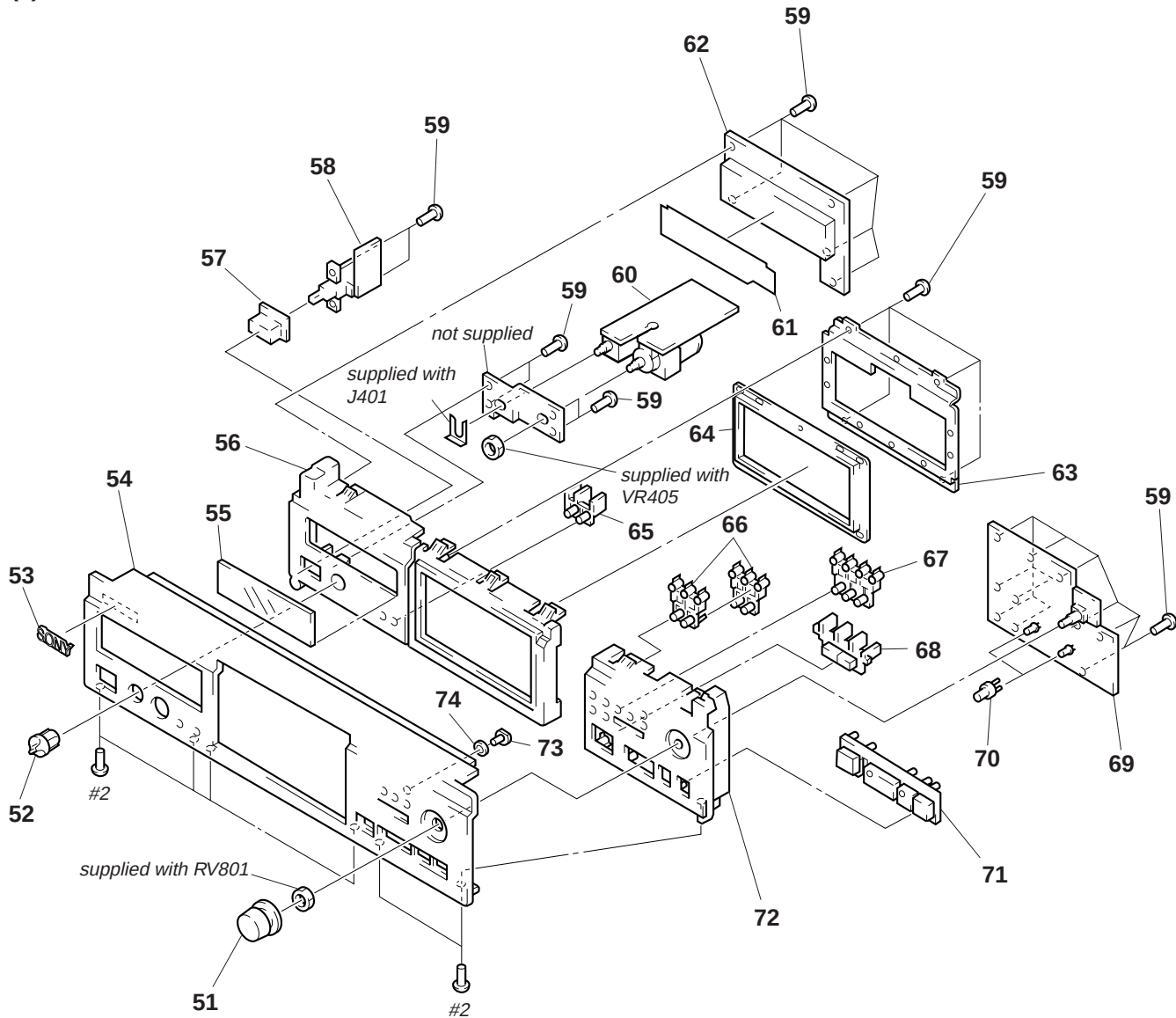
The components identified by mark Δ or dotted line with mark Δ are critical for safety.
Replace only with part number specified.

(1) CASE, LOADING PANEL SECTION



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	3-703-685-21	SCREW (+BV 3X8)		6	1-777-844-11	WIRE (FLAT TYPE) (9 CORE)	
2	4-970-998-21	BOLT (LID), HEXAGON HOLE (GOLD)		7	1-777-845-11	WIRE (FLAT TYPE) (10 CORE)	
2	4-970-998-31	BOLT (LID), HEXAGON HOLE (BLACK)		8	4-959-077-01	DAMPER	
3	4-987-965-01	EMBLEM (FIXED PICKUP) (GOLD)		* 9	4-615-354-01	SPACER	
3	4-987-965-11	EMBLEM (FIXED PICKUP) (BLACK)		10	3-363-099-01	SCREW (CASE 3 TP2) (BLACK)	
4	4-986-744-01	PANEL, LOADING (GOLD)		10	3-363-099-11	SCREW (CASE 3 TP2) (GOLD)	
4	4-986-744-11	PANEL, LOADING (BLACK)		11	4-969-469-01	CASE (BLACK)	
5	4-986-745-01	BASE, LOADING PANEL (GOLD)		11	4-969-469-31	CASE (GOLD)	
5	4-986-745-11	BASE, LOADING PANEL (BLACK)		* 12	4-962-329-01	DAMPER	

(2) FRONT PANEL SECTION

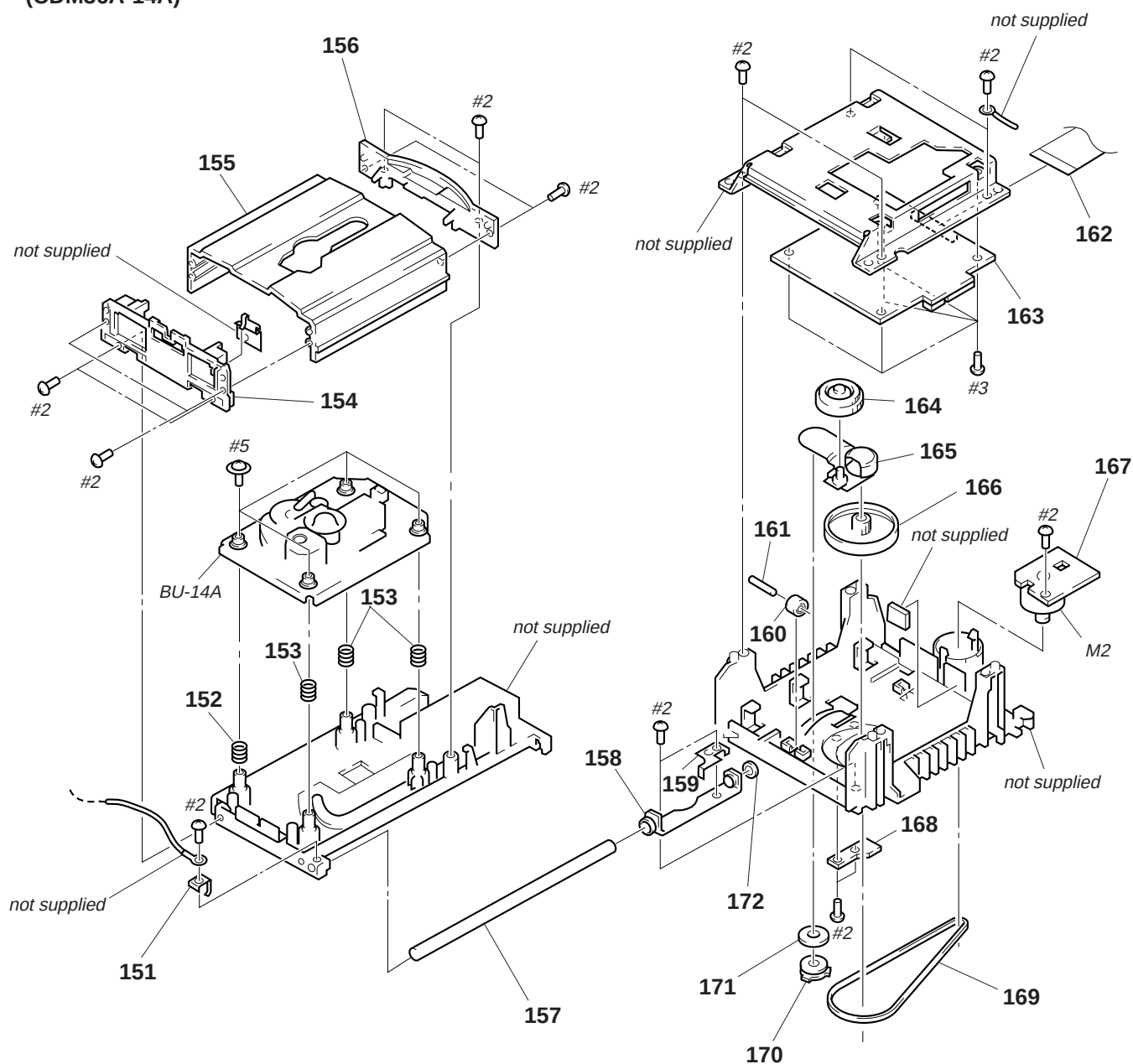


Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
51	4-987-121-01	KNOB (AMS) (GOLD)		64	4-986-667-01	PACKING	
51	4-987-121-11	KNOB (AMS) (BLACK)		65	4-986-687-01	BUTTON (P.MODE) (GOLD)	
52	4-950-189-01	KNOB (A) (VOL) (BLACK)		65	4-986-687-11	BUTTON (P.MODE) (BLACK)	
52	4-950-189-41	KNOB (A) (VOL) (GOLD)		66	4-986-671-01	BUTTON (2) (GOLD)	
53	4-942-568-01	EMBLEM (NO.5), SONY (BLACK)		66	4-986-671-11	BUTTON (2) (BLACK)	
53	4-942-568-31	EMBLEM (NO.5), SONY (GOLD)		67	4-986-672-01	BUTTON (3) (GOLD)	
54	4-986-664-01	PANEL, FRONT (GOLD)		67	4-986-672-11	BUTTON (3) (BLACK)	
54	4-986-664-11	PANEL, FRONT (BLACK)		68	4-986-673-01	BUTTON (FF) (◀◀. ▶▶) (GOLD)	
55	4-986-670-01	PLATE, INDICATION		68	4-986-673-11	BUTTON (FF) (◀◀. ▶▶) (BLACK)	
56	4-986-666-01	BASE (L), PANEL (GOLD)		* 69	A-4699-354-A	PANEL BOARD, COMPLETE	
56	4-986-666-11	BASE (L), PANEL (BLACK)		* 70	3-362-478-01	HOLDER (T), LED	
57	4-923-520-51	KNOB, POWER (POWER) (BLACK)		71	X-4945-276-1	BUTTON (PLAY) ASSY (≡ OPEN/CLOSE. ▶. II. ■) (BLACK)	
57	4-923-520-61	KNOB, POWER (POWER) (GOLD)		71	X-4948-030-1	BUTTON (PLAY) ASSY (≡ OPEN/CLOSE. ▶. II. ■) (GOLD)	
* 58	1-663-575-12	POWER SW BOARD		72	4-986-665-01	BASE (R), PANEL (GOLD)	
59	4-951-620-01	SCREW (2.6X8), +BVTP		72	4-986-665-11	BASE (R), PANEL (BLACK)	
* 60	A-4699-566-A	HP BOARD, COMPLETE (BLACK)		73	4-971-776-01	INDICATOR	
* 60	A-4699-710-A	HP BOARD, COMPLETE (GOLD)		74	4-949-302-21	WASHER	
61	4-986-669-01	FILTER					
* 62	A-4699-353-A	DISPLAY BOARD, COMPLETE					
63	4-986-668-01	BRACKET (PACKING)					

[illegible]

– 63 –

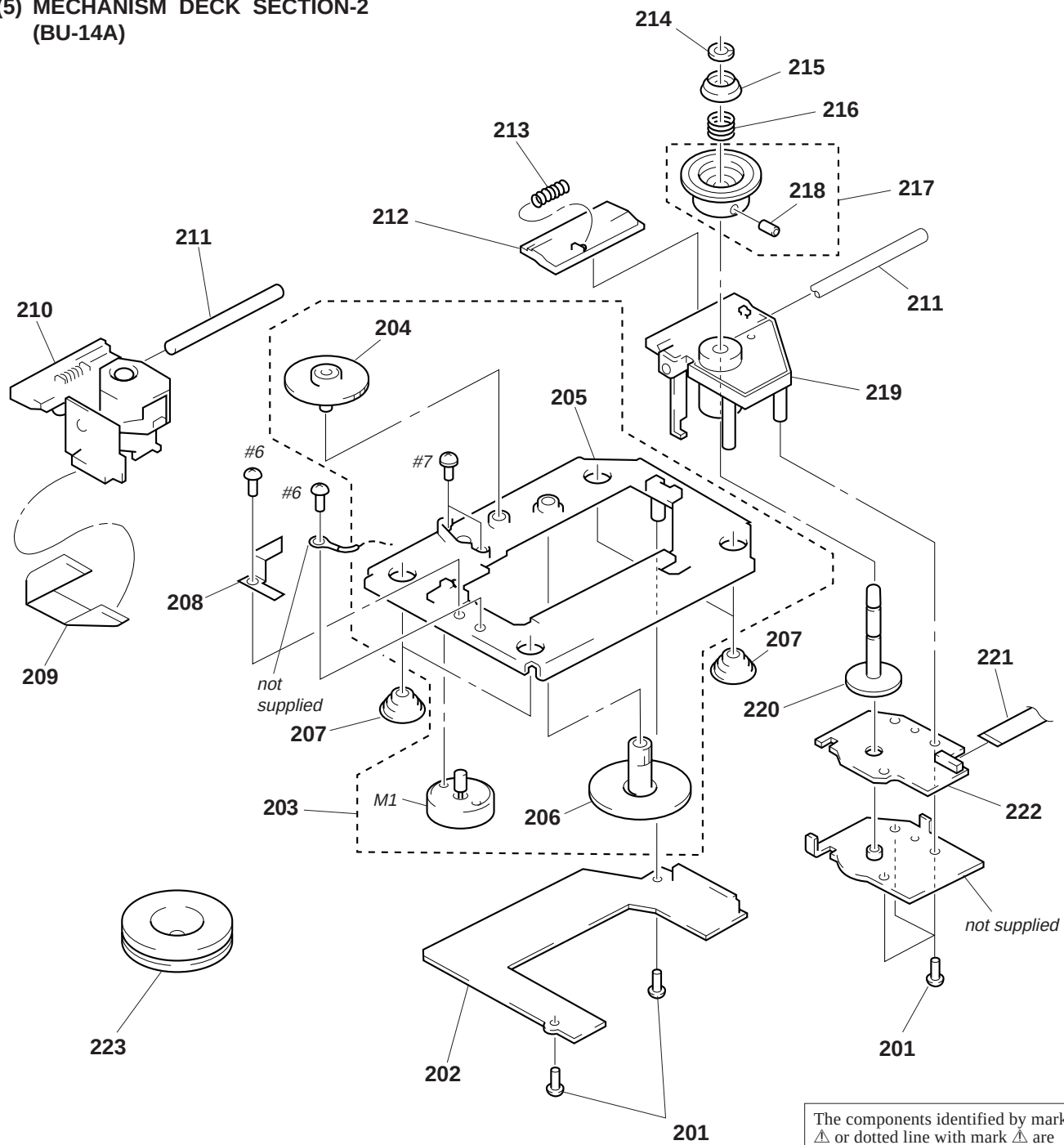
**(4) MECHANISM DECK SECTION-1
(CDM36A-14A)**



Ref. No.	Part No.	Description	Remark
* 151	4-977-889-01	PLATE (BU), GROUND	
152	4-989-303-01	SPRING (BU-LF), COMPRESSION	
153	4-988-104-01	SPRING (BU), COMPRESSION	
* 154	4-986-917-01	COVER (F) (DRAWER)	
155	4-986-916-01	PANEL (DRAWER)	
* 156	4-986-918-01	COVER (R) (DRAWER)	
* 157	4-977-888-01	SHAFT	
* 158	4-977-892-01	BEARING	
* 159	4-977-891-01	PLATE, GROUND	
160	X-4924-457-1	ROLLER ASSY	
161	4-934-376-01	SHAFT (ROLLER)	
162	1-777-843-11	WIRE (FLAT TYPE) (30 CORE)	

Ref. No.	Part No.	Description	Remark
* 163	A-4699-708-A	BD BOARD, COMPLETE	
164	4-977-897-01	GEAR	
165	4-977-898-01	LEVER (SWING)	
166	4-977-896-01	PULLEY	
* 167	1-663-579-11	LOADING MOTOR BOARD	
* 168	1-663-581-11	LOADING SW BOARD	
169	4-968-905-01	BELT (CDM)	
170	4-986-919-01	LIMITTER (LEVER)	
171	4-988-103-01	SLIDER (SWING)	
172	4-988-107-01	CUSHION (LD)	
M2	A-4660-970-A	MOTOR ASSY (LOADING)	

**(5) MECHANISM DECK SECTION-2
(BU-14A)**



The components identified by mark  or dotted line with mark  are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
201	4-951-620-01	SCREW (2.6X8), +BVTP		213	4-977-925-01	SPRING (SLIDE BASE), COMPRESSION	
* 202	1-663-580-11	BD TRANSLATION BOARD		214	4-968-871-01	WASHER (SPINDLE)	
203	A-4672-247-A	BASE (OUTSERT) ASSY		215	4-968-867-01	CAP, CENTERING	
204	4-977-921-01	GEAR (B), FLAT		216	4-968-869-01	SPRING (CENTERING), COMPRESSION	
* 205	4-977-918-01	BASE (OUTSERT)		217	A-4660-814-A	PULLEY ASSY, DISK	
206	4-977-920-01	GEAR (C), FLAT		218	4-971-266-01	SCREW (M2.6X4)	
207	4-917-562-11	INSULATOR		219	X-4947-796-1	BASE ASSY, SLIDE	
* 208	4-977-924-01	SPRING (OP), LEAF		220	X-4947-797-1	ROTOR ASSY	
209	1-775-991-11	WIRE (FLAT TYPE) (16 CORE)		221	1-777-842-11	WIRE (FLAT TYPE) (10 CORE)	
△ 210	8-848-379-31	OPTICAL PICK-UP KSS-213B/S-N		222	A-4699-360-A	BSL BOARD, COMPLETE	
211	4-977-923-01	SHAFT, SLED		223	X-4947-838-1	STABILIZER ASSY	
212	4-977-926-01	RACK, SLIDE		M1	X-4947-303-1	MOTOR ASSY (SLED)	

SECTION 8 ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
All resistors are in ohms.
METAL: Metal-film resistor.
METAL OXIDE: Metal oxide-film resistor.
F: nonflammable

- Items marked “*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
In each case, u: μ , for example:
uA. . : μ A. . uPA. . : μ PA. .
uPB. . : μ PB. . uPC. . : μ PC. .
uPD. . : μ PD. .
- CAPACITORS
uF: μ F
- COILS
uH: μ H

The components identified by mark Δ or dotted line with mark Δ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description	Remark				Ref. No.	Part No.	Description	Remark			
*	A-4699-708-A	BD BOARD, COMPLETE *****					C163	1-164-492-11	CERAMIC CHIP	0.15uF	10%	16V	
		< CAPACITOR >					C171	1-163-005-11	CERAMIC CHIP	470PF	10%	50V	
C93	1-124-997-11	ELECT	470uF	20%	10V		C172	1-163-005-11	CERAMIC CHIP	470PF	10%	50V	
C94	1-124-997-11	ELECT	470uF	20%	10V		C173	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C101	1-163-005-11	CERAMIC CHIP	470PF	10%	50V		C175	1-163-038-00	CERAMIC CHIP	0.1uF		25V	
C102	1-163-038-00	CERAMIC CHIP	0.1uF		25V		C261	1-126-177-11	ELECT	100uF	20%	10V	
C103	1-163-005-11	CERAMIC CHIP	470PF	10%	50V		C325	1-163-038-00	CERAMIC CHIP	0.1uF		25V	
C104	1-163-145-00	CERAMIC CHIP	0.0015uF	5%	50V		C351	1-125-622-11	CAPACITOR	0.1F		5.5V	
C105	1-135-155-21	TANTALUM CHIP	4.7uF	10%	16V		C352	1-163-038-00	CERAMIC CHIP	0.1uF		25V	
C108	1-163-035-00	CERAMIC CHIP	0.047uF		50V		C360	1-163-038-00	CERAMIC CHIP	0.1uF		25V	
C109	1-163-145-00	CERAMIC CHIP	0.0015uF	5%	50V		C370	1-163-038-00	CERAMIC CHIP	0.1uF		25V	
C110	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V		C371	1-163-038-00	CERAMIC CHIP	0.1uF		25V	
C111	1-163-251-11	CERAMIC CHIP	100PF	5%	50V		C372	1-126-177-11	ELECT	100uF	20%	10V	
C112	1-163-038-00	CERAMIC CHIP	0.1uF		25V				< CONNECTOR >				
C113	1-163-038-00	CERAMIC CHIP	0.1uF		25V		CN101	1-691-894-21	SOCKET, CONNECTOR 16P				
C114	1-163-038-00	CERAMIC CHIP	0.1uF		25V		* CN102	1-563-017-11	CONNECTOR, FPC 30P				
C115	1-124-673-11	ELECT	100uF	20%	10V		* CN103	1-568-941-11	PIN, CONNECTOR 3P				
C116	1-124-673-11	ELECT	100uF	20%	10V		* CN104	1-564-518-11	PLUG, CONNECTOR 3P				
C117	1-126-209-11	ELECT	100uF	20%	4V		* CN105	1-564-518-11	PLUG, CONNECTOR 3P				
C118	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V		CN106	1-568-853-11	SOCKET, CONNECTOR 10P				
C119	1-163-231-11	CERAMIC CHIP	15PF	5%	50V		* CN107	1-568-852-11	SOCKET, CONNECTOR 9P				
C122	1-164-336-11	CERAMIC CHIP	0.33uF		25V		CN113	1-506-481-11	PIN, CONNECTOR 2P				
C123	1-164-232-11	CERAMIC CHIP	0.01uF		50V				< DIODE >				
C124	1-164-005-11	CERAMIC CHIP	0.47uF		25V		D101	8-719-016-74	DIODE 1SS352				
C125	1-163-038-00	CERAMIC CHIP	0.1uF		25V		D351	8-719-016-74	DIODE 1SS352				
C126	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V		D361	8-719-938-07	DIODE GL480				
C127	1-163-038-00	CERAMIC CHIP	0.1uF		25V				< IC >				
C128	1-163-038-00	CERAMIC CHIP	0.1uF		25V		IC101	8-752-369-78	IC CXD2545Q				
C131	1-164-346-11	CERAMIC CHIP	1uF		16V		IC102	8-759-071-79	IC BA6297AFP				
C132	1-164-346-11	CERAMIC CHIP	1uF		16V		IC103	8-752-072-45	IC CXA1821M-T6				
C140	1-163-038-00	CERAMIC CHIP	0.1uF		25V		IC104	8-759-071-79	IC BA6297AFP				
C141	1-163-038-00	CERAMIC CHIP	0.1uF		25V		IC351	8-752-884-95	IC CXP84124-068Q				
C151	1-163-005-11	CERAMIC CHIP	470PF	10%	50V		IC352	8-759-289-94	IC LH5160TF				
C152	1-163-005-11	CERAMIC CHIP	470PF	10%	50V		IC361	8-749-010-61	IC IS471F				
C153	1-163-038-00	CERAMIC CHIP	0.1uF		25V				< COIL >				
C154	1-164-336-11	CERAMIC CHIP	0.33uF		25V		L101	1-414-234-11	INDUCTOR, FERRITE BEAD				
C155	1-163-005-11	CERAMIC CHIP	470PF	10%	50V								
C156	1-163-005-11	CERAMIC CHIP	470PF	10%	50V								
C157	1-163-023-00	CERAMIC CHIP	0.015uF	5%	50V								
C158	1-163-023-00	CERAMIC CHIP	0.015uF	5%	50V								
C161	1-163-038-00	CERAMIC CHIP	0.1uF		25V								
C162	1-163-038-00	CERAMIC CHIP	0.1uF		25V								

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
< TRANSISTOR >						R153	1-216-073-00	METAL CHIP	10K	5%	1/10W
						R154	1-216-073-00	METAL CHIP	10K	5%	1/10W
Q101	8-729-010-08	TRANSISTOR	MSB710-R			R155	1-216-073-00	METAL CHIP	10K	5%	1/10W
Q102	8-729-010-08	TRANSISTOR	MSB710-R								
Q103	8-729-424-18	TRANSISTOR	UN2113-TX			R156	1-216-073-00	METAL CHIP	10K	5%	1/10W
Q104	8-729-421-19	TRANSISTOR	UN2213			R157	1-216-025-00	METAL GLAZE	100	5%	1/10W
Q105	8-729-424-18	TRANSISTOR	UN2113-TX			R161	1-216-308-00	METAL CHIP	4.7	5%	1/10W
						R167	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
Q106	8-729-421-19	TRANSISTOR	UN2213			R168	1-216-097-00	METAL GLAZE	100K	5%	1/10W
Q301	8-729-424-08	TRANSISTOR	UN2111								
Q302	8-729-421-22	TRANSISTOR	UN2211			R169	1-216-105-00	METAL GLAZE	220K	5%	1/10W
< RESISTOR >						R171	1-216-073-00	METAL CHIP	10K	5%	1/10W
						R172	1-216-073-00	METAL CHIP	10K	5%	1/10W
R101	1-216-077-00	METAL CHIP	15K	5%	1/10W	R173	1-216-073-00	METAL CHIP	10K	5%	1/10W
R102	1-216-097-00	METAL GLAZE	100K	5%	1/10W	R174	1-216-073-00	METAL CHIP	10K	5%	1/10W
R103	1-216-077-00	METAL CHIP	15K	5%	1/10W						
R104	1-216-085-00	METAL CHIP	33K	5%	1/10W	R175	1-216-073-00	METAL CHIP	10K	5%	1/10W
R105	1-216-097-00	METAL GLAZE	100K	5%	1/10W	R176	1-216-073-00	METAL CHIP	10K	5%	1/10W
						R177	1-216-025-00	METAL GLAZE	100	5%	1/10W
R106	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	R179	1-216-308-00	METAL CHIP	4.7	5%	1/10W
R107	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	R180	1-216-659-11	METAL CHIP	2.2K	0.5%	1/10W
R108	1-216-073-00	METAL CHIP	10K	5%	1/10W						
R109	1-216-121-00	METAL GLAZE	1M	5%	1/10W	R181	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R110	1-216-025-00	METAL GLAZE	100	5%	1/10W	R182	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
						R183	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R111	1-216-693-11	METAL CHIP	56K	0.5%	1/10W	R184	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R112	1-216-049-00	METAL GLAZE	1K	5%	1/10W	R186	1-216-105-00	METAL GLAZE	220K	5%	1/10W
R113	1-216-073-00	METAL CHIP	10K	5%	1/10W						
R114	1-216-073-00	METAL CHIP	10K	5%	1/10W	R187	1-216-659-11	METAL CHIP	2.2K	0.5%	1/10W
R115	1-216-677-11	METAL CHIP	12K	0.5%	1/10W	R188	1-216-097-00	METAL GLAZE	100K	5%	1/10W
						R189	1-216-659-11	METAL CHIP	2.2K	0.5%	1/10W
R116	1-216-695-11	METAL CHIP	68K	0.5%	1/10W	R190	1-216-105-00	METAL GLAZE	220K	5%	1/10W
R117	1-216-073-00	METAL CHIP	10K	5%	1/10W	R191	1-216-695-11	METAL CHIP	68K	0.5%	1/10W
R118	1-216-073-00	METAL CHIP	10K	5%	1/10W						
R119	1-216-097-00	METAL GLAZE	100K	5%	1/10W	R192	1-216-001-00	METAL CHIP	10	5%	1/10W
R120	1-216-105-00	METAL GLAZE	220K	5%	1/10W	R193	1-216-001-00	METAL CHIP	10	5%	1/10W
						R195	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R121	1-216-073-00	METAL CHIP	10K	5%	1/10W	R196	1-216-073-00	METAL CHIP	10K	5%	1/10W
R122	1-216-073-00	METAL CHIP	10K	5%	1/10W	R197	1-216-073-00	METAL CHIP	10K	5%	1/10W
R123	1-216-073-00	METAL CHIP	10K	5%	1/10W						
R124	1-216-097-00	METAL GLAZE	100K	5%	1/10W	R301	1-216-623-11	METAL CHIP	68	0.5%	1/10W
R125	1-216-049-00	METAL GLAZE	1K	5%	1/10W	R312	1-216-073-00	METAL CHIP	10K	5%	1/10W
						R351	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R126	1-216-049-00	METAL GLAZE	1K	5%	1/10W	R352	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R127	1-216-049-00	METAL GLAZE	1K	5%	1/10W	R353	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R131	1-216-037-00	METAL CHIP	330	5%	1/10W						
R132	1-216-695-11	METAL CHIP	68K	0.5%	1/10W	R354	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R133	1-216-049-00	METAL GLAZE	1K	5%	1/10W	R355	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
						R356	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R134	1-216-049-00	METAL GLAZE	1K	5%	1/10W	R357	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R135	1-216-295-00	CONDUCTOR, CHIP (2012)				R358	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R136	1-216-295-00	CONDUCTOR, CHIP (2012)									
R137	1-216-295-00	CONDUCTOR, CHIP (2012)				R359	1-216-089-00	METAL GLAZE	47K	5%	1/10W
R138	1-216-295-00	CONDUCTOR, CHIP (2012)				R360	1-216-647-11	METAL CHIP	680	0.5%	1/10W
						R361	1-216-615-11	METAL CHIP	33	0.5%	1/10W
R141	1-216-089-00	METAL GLAZE	47K	5%	1/10W	R362	1-216-295-00	CONDUCTOR, CHIP (2012)			
R142	1-216-081-00	METAL CHIP	22K	5%	1/10W	R364	1-216-017-00	METAL GLAZE	47	5%	1/10W
R143	1-216-103-00	METAL CHIP	180K	5%	1/10W						
R144	1-216-103-00	METAL CHIP	180K	5%	1/10W	R365	1-216-017-00	METAL GLAZE	47	5%	1/10W
R145	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	R366	1-216-073-00	METAL CHIP	10K	5%	1/10W
						R367	1-216-017-00	METAL GLAZE	47	5%	1/10W
R146	1-216-073-00	METAL CHIP	10K	5%	1/10W	R371	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R147	1-216-081-00	METAL CHIP	22K	5%	1/10W	R372	1-216-073-00	METAL CHIP	10K	5%	1/10W
R148	1-216-001-00	METAL CHIP	10	5%	1/10W	< SWITCH >					
R149	1-216-003-11	METAL GLAZE	12	5%	1/10W						
R150	1-216-659-11	METAL CHIP	2.2K	0.5%	1/10W	S153	1-762-930-11	SWITCH, LEVER (LOAD OUT)			
R151	1-216-073-00	METAL CHIP	10K	5%	1/10W						
R152	1-216-073-00	METAL CHIP	10K	5%	1/10W						

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
< VIBRATOR >				< TRANSISTOR >			
X351	1-577-358-21	VIBRATOR, CERAMIC (4MHz)		Q804	8-729-424-18	TRANSISTOR UN2113-TX	
*****				Q805	8-729-421-19	TRANSISTOR UN2213	
*	1-663-580-11	BD TRANSLATION BOARD		< RESISTOR >			
*****				R817	1-216-045-00	METAL CHIP 680 5% 1/10W	
< CONNECTOR >				R827	1-216-029-00	METAL CHIP 150 5% 1/10W	
* CN108	1-568-933-11	SOCKET, CONNECTOR 30P		R828	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
CN109	1-774-380-11	CONNECTOR, FFC/FPC 16P		R829	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
CN110	1-580-864-11	SOCKET, CONNECTOR (SMT) 10P		< SWITCH >			
< SWITCH >				S819	1-554-303-21	SWITCH, TACTILE (P MODE)	
SW102	1-571-958-11	SWITCH, PUSH (1 KEY) (LIMIT SW)		S820	1-554-303-21	SWITCH, TACTILE (TIME)	
*****				*****			
A-4699-360-A	BSL BOARD, COMPLETE			*	A-4699-566-A	HP BOARD, COMPLETE (BLACK)	
*****				*	A-4699-710-A	HP BOARD, COMPLETE (GOLD)	
1-580-881-11	SOCKET, CONNECTOR (SMT) 10P			< CAPACITOR >			
< DIODE >				C365	1-126-012-11	ELECT 470uF 20% 16V	
H11	8-719-987-62	DIODE LT140SAZ		C366	1-126-012-11	ELECT 470uF 20% 16V	
H12	8-719-987-62	DIODE LT140SAZ		C405	1-164-159-11	CERAMIC 0.1uF 50V	
< RESISTOR >				C550	1-162-294-31	CERAMIC 0.001uF 10% 50V	
R01	1-216-295-00	CONDUCTOR, CHIP (2012)		C650	1-162-294-31	CERAMIC 0.001uF 10% 50V	
R02	1-216-295-00	CONDUCTOR, CHIP (2012)		< CONNECTOR >			
R11	1-216-049-00	METAL GLAZE 1K 5% 1/10W		CN402	1-564-523-11	PLUG, CONNECTOR 8P	
R12	1-216-049-00	METAL GLAZE 1K 5% 1/10W		CN407	1-564-524-11	PLUG, CONNECTOR 9P	
*****				< IC >			
*	A-4699-353-A	DISPLAY BOARD, COMPLETE		IC354	8-759-962-08	IC BA6208	
*****				IC356	8-759-981-85	IC RC4556D	
*	4-969-510-01	HOLDER (FL)		< JACK >			
< CAPACITOR >				J401	1-750-162-61	JACK (LARGE TYPE) (PHONES) (BLACK)	
C801	1-163-038-00	CERAMIC CHIP 0.1uF 25V		J401	1-779-219-11	JACK (LARGE TYPE) (PHONES) (GOLD)	
C802	1-163-031-11	CERAMIC CHIP 0.01uF 50V		< COIL >			
C803	1-163-031-11	CERAMIC CHIP 0.01uF 50V		L310	1-412-473-21	INDUCTOR 0uH	
C804	1-163-031-11	CERAMIC CHIP 0.01uF 50V		L311	1-412-473-21	INDUCTOR 0uH	
C805	1-163-031-11	CERAMIC CHIP 0.01uF 50V		L503	1-412-473-21	INDUCTOR 0uH	
C806	1-163-031-11	CERAMIC CHIP 0.01uF 50V		L603	1-412-473-21	INDUCTOR 0uH	
C807	1-163-031-11	CERAMIC CHIP 0.01uF 50V		< TRANSISTOR >			
< CONNECTOR >				Q504	8-729-141-30	TRANSISTOR 2SC3623A-LK	
CN810	1-568-853-11	SOCKET, CONNECTOR 10P		Q604	8-729-141-30	TRANSISTOR 2SC3623A-LK	
< FLUORECENT INDICATOR >				< RESISTOR >			
FLD801	1-517-357-11	INDICATOR TUBE, FLUORESCENT		R369	1-247-807-31	CARBON 100 5% 1/4W	
< IC >				R370	1-247-807-31	CARBON 100 5% 1/4W	
IC801	8-759-324-36	IC LC7570E		R532	1-249-441-11	CARBON 100K 5% 1/4W	
IC802	8-759-324-36	IC LC7570E		R533	1-247-890-11	CARBON 300K 5% 1/4W	
IC803	8-759-324-36	IC LC7570E		R534	1-249-441-11	CARBON 100K 5% 1/4W	
IC804	8-759-373-48	IC NJL53H400		R535	1-247-890-11	CARBON 300K 5% 1/4W	
				R536	1-249-402-11	CARBON 56 5% 1/4W	
				R537	1-249-425-11	CARBON 4.7K 5% 1/4W	
				R632	1-249-441-11	CARBON 100K 5% 1/4W	
				R633	1-247-890-11	CARBON 300K 5% 1/4W	

HP

LOADING MOTOR

LOADING SW

MAIN

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark					
R634	1-249-441-11	CARBON	100K	5%	1/4W	C266	1-136-850-11	FILM	0.1uF	5%	63V			
R635	1-247-890-11	CARBON	300K	5%	1/4W	C271	1-124-994-11	ELECT	100uF	20%	10V			
R636	1-249-402-11	CARBON	56	5%	1/4W	C272	1-164-159-11	CERAMIC	0.1uF		50V			
R637	1-249-425-11	CARBON	4.7K	5%	1/4W	C274	1-164-159-11	CERAMIC	0.1uF		50V			
< VARIABLE RESISTOR >						C301	1-164-159-11	CERAMIC	0.1uF		50V			
VR405	1-223-747-11	RES, VAR, CARBON 10K/10K (LINE OUT PHONE LEVEL)				C306	1-162-208-31	CERAMIC	24PF	5%	50V			
						C307	1-164-159-11	CERAMIC	0.1uF		50V			
						C310	1-164-159-11	CERAMIC	0.1uF		50V			
						C320	1-128-200-11	ELECT	47uF	20%	63V			
*****						C321	1-128-202-11	ELECT	220uF	20%	63V			
*	1-663-579-11	LOADING MOTOR BOARD *****				C322	1-117-775-11	FILM	0.1uF	10%	250V			
						C323	1-102-947-00	CERAMIC	10PF	5%	50V			
						C324	1-102-947-00	CERAMIC	10PF	5%	50V			
						C358	1-164-159-11	CERAMIC	0.1uF		50V			
C181	1-126-023-11	ELECT	100uF	20%	25V	C359	1-126-012-11	ELECT	470uF	20%	16V			
C182	1-126-023-11	ELECT	100uF	20%	25V	C360	1-124-686-71	ELECT	220uF	20%	16V			
C183	1-164-699-11	CERAMIC CHIP	0.0033uF	5%	50V	C362	1-117-914-51	ELECT	330uF	20%	25V			
C184	1-126-059-11	ELECT	10uF	20%	50V	C363	1-117-914-51	ELECT	330uF	20%	25V			
C185	1-163-038-00	CERAMIC CHIP	0.1uF		25V	C364	1-124-686-71	ELECT	220uF	20%	16V			
< IC >						C370	1-164-159-11	CERAMIC	0.1uF		50V			
IC181	8-759-202-01	IC TA7256P				C371	1-164-159-11	CERAMIC	0.1uF		50V			
IC182	8-759-100-96	IC uPC4558G2				C501	1-136-850-11	FILM	0.1uF	5%	63V			
< RESISTOR >						C502	1-126-023-11	ELECT	100uF	20%	25V			
						C503	1-136-850-11	FILM	0.1uF	5%	63V			
R001	1-216-073-00	METAL CHIP	10K	5%	1/10W	C504	1-128-198-11	ELECT	22uF	20%	50V			
R002	1-216-073-00	METAL CHIP	10K	5%	1/10W	C505	1-136-850-11	FILM	0.1uF	5%	63V			
R003	1-216-073-00	METAL CHIP	10K	5%	1/10W	C510	1-128-200-11	ELECT	47uF	20%	63V			
R004	1-216-073-00	METAL CHIP	10K	5%	1/10W	C512	1-130-892-00	FILM	0.015uF	5%	63V			
R005	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	C516	1-136-850-11	FILM	0.1uF	5%	63V			
R006	1-216-047-00	METAL GLAZE	820	5%	1/10W	C517	1-136-850-11	FILM	0.1uF	5%	63V			
R007	1-216-025-00	METAL GLAZE	100	5%	1/10W	C518	1-128-200-11	ELECT	47uF	20%	63V			
R008	1-216-045-00	METAL CHIP	680	5%	1/10W	C519	1-128-198-51	ELECT	22uF	20%	63V			
i R009	1-249-474-11	CARBON	1	5%	1/2W F	C520	1-128-200-11	ELECT	47uF	20%	63V			
	R010	1-216-001-00	METAL CHIP	10	5%	1/10W	C521	1-130-973-00	FILM	0.022uF	5%	100V		
*****						C522	1-130-955-00	FILM	0.01uF	5%	100V			
						C523	1-130-955-00	FILM	0.01uF	5%	100V			
*	1-663-581-11	LOADING SW BOARD *****				C524	1-130-339-11	FILM	0.0056uF	5%	100V			
						C525	1-130-339-11	FILM	0.0056uF	5%	100V			
						C526	1-136-814-11	FILM	0.001uF	5%	100V			
						C527	1-136-814-11	FILM	0.001uF	5%	100V			
S152	1-762-424-11	SWITCH, MICRO (LOADING SW)				C530	1-136-817-11	FILM	0.0033uF	2%	100V			
*****						C531	1-136-813-11	FILM	680PF	5%	100V			
*****						C532	1-128-201-11	ELECT	100uF	20%	50V			
*	A-4699-567-A	MAIN BOARD, COMPLETE *****				C533	1-137-506-11	FILM	0.47uF	10%	63V			
						C535	1-136-802-11	FILM	0.015uF	5%	100V			
						C536	1-128-198-51	ELECT	22uF	20%	63V			
						C537	1-128-201-11	ELECT	100uF	20%	50V			
C259	1-161-494-00	CERAMIC	0.022uF		25V	C601	1-136-850-11	FILM	0.1uF	5%	63V			
C260	1-162-215-31	CERAMIC	47PF	5%	50V	C602	1-126-023-11	ELECT	100uF	20%	25V			
C261	1-136-850-11	FILM	0.1uF	5%	63V	C603	1-136-850-11	FILM	0.1uF	5%	63V			
C262	1-136-850-11	FILM	0.1uF	5%	63V	C604	1-128-198-11	ELECT	22uF	20%	50V			
C263	1-136-850-11	FILM	0.1uF	5%	63V	C605	1-136-850-11	FILM	0.1uF	5%	63V			
C264	1-136-850-11	FILM	0.1uF	5%	63V	C610	1-128-200-11	ELECT	47uF	20%	63V			

The components identified by mark Δ or dotted line with mark Δ are critical for safety.
Replace only with part number specified.

MAIN

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
C612	1-136-802-11	FILM	0.015uF	5%	100V	IC503	8-759-259-12	IC OPA2604AP			
C615	1-130-973-00	FILM	0.022uF	5%	100V	IC601	8-759-371-51	IC CXA8042AS			
C616	1-136-850-11	FILM	0.1uF	5%	63V	IC602	8-759-443-33	IC OPA2132PA			
C617	1-136-850-11	FILM	0.1uF	5%	63V	IC603	8-759-259-12	IC OPA2604AP			
C618	1-136-850-11	FILM	0.1uF	5%	63V	< JACK >					
C619	1-128-198-11	ELECT	22uF	20%	50V	J301	1-569-443-21	JACK, PIN 4P (LINE OUT)			
C620	1-128-198-11	ELECT	22uF	20%	50V	J351	1-770-905-21	JACK, PIN 1P (DIGITAL OUT COAXIAL)			
C621	1-130-973-00	FILM	0.022uF	5%	100V	< COIL >					
C622	1-130-955-00	FILM	0.01uF	5%	100V	L251	1-410-322-11	INDUCTOR	3.3uH		
C623	1-130-955-00	FILM	0.01uF	5%	100V	L252	1-410-322-11	INDUCTOR	3.3uH		
C624	1-130-339-11	FILM	0.0056uF	5%	100V	L302	1-410-503-11	INDUCTOR	3.3uH		
C625	1-130-339-11	FILM	0.0056uF	5%	100V	L303	1-410-322-11	INDUCTOR	3.3uH		
C626	1-136-814-11	FILM	0.001uF	5%	100V	L304	1-410-970-11	INDUCTOR	6.8uH		
C627	1-136-814-11	FILM	0.001uF	5%	100V	L504	1-412-473-21	INDUCTOR	0uH		
C630	1-136-817-11	FILM	0.0033uF	2%	100V	L505	1-412-473-21	INDUCTOR	0uH		
C631	1-136-813-11	FILM	680PF	5%	100V	L604	1-412-473-21	INDUCTOR	0uH		
C632	1-128-201-11	ELECT	100uF	20%	50V	L605	1-412-473-21	INDUCTOR	0uH		
C633	1-137-506-11	FILM	0.47uF	10%	63V	< FILTER >					
C635	1-136-802-11	FILM	0.015uF	5%	100V	LPF201	1-424-153-11	FILTER, NOISE			
C636	1-128-198-51	ELECT	22uF	20%	63V	LPF202	1-424-153-11	FILTER, NOISE			
C637	1-128-201-11	ELECT	100uF	20%	50V	LPF301	1-424-153-11	FILTER, NOISE			
< CONNECTOR >						< TRANSISTOR >					
CN201	1-564-506-11	PLUG, CONNECTOR 3P				Q301	8-729-900-65	TRANSISTOR DTA144ES			
* CN301	1-568-835-11	SOCKET, CONNECTOR 16P				< RESISTOR >					
CN302	1-564-511-11	PLUG, CONNECTOR 8P				R254	1-249-393-11	CARBON	10	5%	1/4W
* CN303	1-564-509-11	PLUG, CONNECTOR 6P				R255	1-249-417-11	CARBON	1K	5%	1/4W
CN304	1-564-509-11	PLUG, CONNECTOR 6P				R256	1-249-401-11	CARBON	47	5%	1/4W
CN305	1-564-506-11	PLUG, CONNECTOR 3P				R257	1-249-393-11	CARBON	10	5%	1/4W
< DIODE >						R258	1-249-417-11	CARBON	1K	5%	1/4W
D220	8-719-210-21	DIODE 11EQS04				R259	1-249-417-11	CARBON	1K	5%	1/4W
D221	8-719-210-21	DIODE 11EQS04				R260	1-249-417-11	CARBON	1K	5%	1/4W
D261	8-719-987-31	DIODE 1N4148M				R262	1-249-401-11	CARBON	47	5%	1/4W
D262	8-719-987-31	DIODE 1N4148M				R263	1-249-393-11	CARBON	10	5%	1/4W
D263	8-719-987-31	DIODE 1N4148M				R301	1-249-437-11	CARBON	47K	5%	1/4W
D264	8-719-987-31	DIODE 1N4148M				R302	1-249-417-11	CARBON	1K	5%	1/4W
D301	8-719-987-63	DIODE 1N4148M				R303	1-249-417-11	CARBON	1K	5%	1/4W
D302	8-719-109-98	DIODE RD6.8ES-B3				R306	1-249-409-11	CARBON	220	5%	1/4W
D303	8-719-987-63	DIODE 1N4148M				R307	1-249-417-11	CARBON	1K	5%	1/4W
< IC >						R310	1-249-441-11	CARBON	100K	5%	1/4W
IC208	8-749-921-12	IC GP1F32T (DIGITAL OUT OPTICAL)				R311	1-249-417-11	CARBON	1K	5%	1/4W
IC211	8-759-604-86	IC M5F7807L				R312	1-249-417-11	CARBON	1K	5%	1/4W
IC212	8-759-604-90	IC M5F7907L				R313	1-249-411-11	CARBON	330	5%	1/4W
IC213	8-759-231-53	IC TA7805S				R314	1-249-417-11	CARBON	1K	5%	1/4W
IC251	8-759-242-70	IC TC7WU04F				R315	1-249-411-11	CARBON	330	5%	1/4W
IC301	8-759-462-70	IC CXD8679Q				R316	1-249-441-11	CARBON	100K	5%	1/4W
IC302	8-759-454-42	IC CXD2562Q-CS				R317	1-249-409-11	CARBON	220	5%	1/4W
IC303	8-759-180-84	IC TC7W74F				R321	1-249-429-11	CARBON	10K	5%	1/4W
IC501	8-759-371-51	IC CXA8042AS				i R351	1-217-997-11	FUSIBLE	10	5%	1/2W F
IC502	8-759-443-33	IC OPA2132PA									

The components identified by mark $\triangle$ or dotted line with mark $\triangle$ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
R501	1-259-380-11	CARBON	10	5%	1/6W			< TRANSFORMER >			
R502	1-259-380-11	CARBON	10	5%	1/6W	T201	1-409-594-11	COIL (WITH CORE)			
R503	1-259-380-11	CARBON	10	5%	1/6W			< VIBRATOR >			
R504	1-259-380-11	CARBON	10	5%	1/6W						
R505	1-249-455-11	CARBON	4.7	5%	1/4W	X321	1-579-161-11	VIBRATOR, CRYSTAL (45MHz)			
R506	1-249-520-11	CARBON	47	5%	1/4W	*****					
R508	1-249-911-11	CARBON	330	1%	1/4W	*	A-4699-354-A	PANEL BOARD, COMPLETE			
R509	1-249-911-11	CARBON	330	1%	1/4W			*****			
R510	1-249-887-11	CARBON	33	1%	1/4W			< CONNECTOR >			
R511	1-249-887-11	CARBON	33	1%	1/4W						
R512	1-249-931-11	CARBON	2.2K	1%	1/4W	* CN817	1-568-852-11	SOCKET, CONNECTOR 9P			
R513	1-249-931-11	CARBON	2.2K	1%	1/4W			< DIODE >			
R514	1-249-933-11	CARBON	2.7K	1%	1/4W						
R515	1-249-933-11	CARBON	2.7K	1%	1/4W	D801	8-719-303-02	DIODE SEL2510C-D (▶)			
R516	1-249-553-11	CARBON	1.1K	5%	1/4W	D802	8-719-301-52	DIODE SEL2810A-C (■)			
R517	1-249-560-00	CARBON	2.2K	5%	1/4W	D803	8-719-046-41	DIODE SEL5521C-TP15 (FILTER)			
R519	1-249-528-00	CARBON	100	5%	1/4W			< TRANSISTOR >			
R520	1-249-606-11	CARBON	180K	5%	1/4W	Q801	8-729-900-80	TRANSISTOR DTC114ES			
R523	1-247-891-00	CARBON	330K	5%	1/4W	Q802	8-729-900-80	TRANSISTOR DTC114ES			
R539	1-259-416-11	CARBON	330	5%	1/6W	Q803	8-729-900-80	TRANSISTOR DTC114ES			
R540	1-259-416-11	CARBON	330	5%	1/6W			< RESISTOR >			
R541	1-259-416-11	CARBON	330	5%	1/6W	R801	1-249-415-11	CARBON 680 5% 1/4W			
R542	1-259-416-11	CARBON	330	5%	1/6W	R802	1-249-417-11	CARBON 1K 5% 1/4W			
R543	1-249-504-11	CARBON	10	5%	1/4W	R803	1-249-419-11	CARBON 1.5K 5% 1/4W			
R550	1-249-917-11	CARBON	560	1%	1/4W	R804	1-249-421-11	CARBON 2.2K 5% 1/4W			
R551	1-249-560-00	CARBON	2.2K	5%	1/4W	R805	1-247-843-11	CARBON 3.3K 5% 1/4W			
R601	1-259-380-11	CARBON	10	5%	1/6W	R806	1-249-427-11	CARBON 6.8K 5% 1/4W			
R602	1-259-380-11	CARBON	10	5%	1/6W	R811	1-249-415-11	CARBON 680 5% 1/4W			
R603	1-259-380-11	CARBON	10	5%	1/6W	R812	1-249-417-11	CARBON 1K 5% 1/4W			
R604	1-259-380-11	CARBON	10	5%	1/6W	R813	1-249-419-11	CARBON 1.5K 5% 1/4W			
R605	1-249-455-11	CARBON	4.7	5%	1/4W	R814	1-249-421-11	CARBON 2.2K 5% 1/4W			
R606	1-249-520-11	CARBON	47	5%	1/4W	R815	1-247-843-11	CARBON 3.3K 5% 1/4W			
R608	1-249-911-11	CARBON	330	1%	1/4W	R816	1-249-427-11	CARBON 6.8K 5% 1/4W			
R609	1-249-911-11	CARBON	330	1%	1/4W	R821	1-249-410-11	CARBON 270 5% 1/4W			
R610	1-249-887-11	CARBON	33	1%	1/4W	R822	1-249-406-11	CARBON 120 5% 1/4W			
R611	1-249-887-11	CARBON	33	1%	1/4W	R823	1-249-410-11	CARBON 270 5% 1/4W			
R612	1-249-931-11	CARBON	2.2K	1%	1/4W	R831	1-249-429-11	CARBON 10K 5% 1/4W			
R613	1-249-931-11	CARBON	2.2K	1%	1/4W	R832	1-249-429-11	CARBON 10K 5% 1/4W			
R614	1-249-933-11	CARBON	2.7K	1%	1/4W			< VARIABLE RESISTOR >			
R615	1-249-933-11	CARBON	2.7K	1%	1/4W	RV801	1-475-006-11	ENCODER, ROTARY (AMS/II<KID>I PUSH ENTER)			
R616	1-249-553-11	CARBON	1.1K	5%	1/4W			< SWITCH >			
R617	1-249-560-00	CARBON	2.2K	5%	1/4W	S801	1-554-303-21	SWITCH, TACTILE (ERASE)			
R619	1-249-528-00	CARBON	100	5%	1/4W	S802	1-554-303-21	SWITCH, TACTILE (CHECK)			
R620	1-249-606-11	CARBON	180K	5%	1/4W	S803	1-554-303-21	SWITCH, TACTILE (CLEAR)			
R623	1-247-891-00	CARBON	330K	5%	1/4W	S804	1-554-303-21	SWITCH, TACTILE (FILTER)			
R639	1-259-416-11	CARBON	330	5%	1/6W	S805	1-554-303-21	SWITCH, TACTILE (◀▶)			
R640	1-259-416-11	CARBON	330	5%	1/6W	S806	1-554-303-21	SWITCH, TACTILE (▶▶)			
R641	1-259-416-11	CARBON	330	5%	1/6W	S811	1-554-303-21	SWITCH, TACTILE (EDIT/TIME FADE)			
R642	1-259-416-11	CARBON	330	5%	1/6W	S812	1-554-303-21	SWITCH, TACTILE (REPEAT)			
R643	1-249-504-11	CARBON	10	5%	1/4W	S813	1-554-303-21	SWITCH, TACTILE (FILE)			
R650	1-249-917-11	CARBON	560	1%	1/4W	S814	1-554-303-21	SWITCH, TACTILE (≡ OPEN/CLOSE)			
R651	1-249-560-00	CARBON	2.2K	5%	1/4W						
		< RELAY >									
RY301	1-515-804-11	RELAY									

PANEL
POWER
POWER SW

Ref. No.	Part No.	Description	Remark
S815	1-554-303-21	SWITCH, TACTILE (▶)	
S816	1-554-303-21	SWITCH, TACTILE (■)	
S817	1-554-303-21	SWITCH, TACTILE (■)	

*	A-4699-712-A	POWER BOARD, COMPLETE	

*	4-962-201-01	PLATE (HP), GROUND	
	7-685-871-01	SCREW +BVTT 3X6 (S)	
< CAPACITOR >			
C201	1-110-578-11	ELECT 3300uF 20% 25V	
C202	1-110-578-11	ELECT 3300uF 20% 25V	
C203	1-128-091-11	ELECT 1000uF 20% 50V	
C204	1-128-091-11	ELECT 1000uF 20% 50V	
C207	1-124-556-11	ELECT 2200uF 20% 16V	
C209	1-124-563-11	ELECT 2200uF 20% 25V	
C210	1-162-294-31	CERAMIC 0.001uF 10% 50V	
C211	1-126-162-11	ELECT 3.3uF 20% 50V	
C213	1-162-294-31	CERAMIC 0.001uF 10% 50V	
C215	1-126-059-11	ELECT 10uF 20% 50V	
C216	1-126-017-11	ELECT 6800uF 20% 16V	
C217	1-126-017-11	ELECT 6800uF 20% 16V	
C218	1-124-556-11	ELECT 2200uF 20% 16V	
C219	1-124-556-11	ELECT 2200uF 20% 16V	
C220	1-164-159-11	CERAMIC 0.1uF 50V	
C221	1-162-286-31	CERAMIC 220PF 10% 50V	
C251	1-126-026-11	ELECT 470uF 20% 25V	
C252	1-126-059-11	ELECT 10uF 20% 50V	
C253	1-126-059-11	ELECT 10uF 20% 50V	
< CONNECTOR >			
* CN203	1-564-509-11	PLUG, CONNECTOR 6P	
CN204	1-691-766-11	PLUG (MICRO CONNECTOR) 4P	
CN205	1-564-506-11	PLUG, CONNECTOR 3P	
* CN206	1-568-954-11	PIN, CONNECTOR 5P	
* CN207	1-564-512-11	PLUG, CONNECTOR 9P	
* CN251	1-564-506-11	PLUG, CONNECTOR 3P	
* CN309	1-564-514-11	PLUG, CONNECTOR 11P	
< DIODE >			
D201	8-719-210-21	DIODE 11EQS04	
D202	8-719-210-21	DIODE 11EQS04	
D203	8-719-210-21	DIODE 11EQS04	
D204	8-719-210-21	DIODE 11EQS04	
D205	8-719-210-21	DIODE 11EQS04	
D206	8-719-975-85	DIODE ERB83-004	
D207	8-719-975-85	DIODE ERB83-004	
D208	8-719-975-85	DIODE ERB83-004	
D209	8-719-975-85	DIODE ERB83-004	
D210	8-719-987-63	DIODE 1N4148M	
D211	8-719-114-30	DIODE RD5.1JS-B2	

Ref. No.	Part No.	Description	Remark
D212	8-719-210-21	DIODE 11EQS04	
D213	8-719-987-63	DIODE 1N4148M	
D214	8-719-987-63	DIODE 1N4148M	
D215	8-719-987-63	DIODE 1N4148M	
D251	8-719-024-99	DIODE 11ES2-NTA2B	
D252	8-719-010-89	DIODE UZ-18BSA-TP	
D253	8-719-114-30	DIODE RD5.1JS-B2	
D353	8-719-987-63	DIODE 1N4148M	
< GROUND TERMINAL >			
EB201	1-537-770-21	TERMINAL BOARD, GROUND	
< IC >			
IC201	8-759-231-58	IC TA7812S	
IC202	8-759-245-86	IC TA7912S	
IC204	8-759-231-53	IC TA7805S	
IC206	8-759-636-16	IC M51957AL	
IC209	8-759-231-53	IC TA7805S	
IC210	8-759-245-79	IC TA79005S	
< TRANSISTOR >			
Q251	8-729-140-97	TRANSISTOR 2SB734-34	
Q352	8-729-422-57	TRANSISTOR UN4111	
< RESISTOR >			
R201	1-249-436-11	CARBON 39K 5% 1/4W	
R202	1-249-431-11	CARBON 15K 5% 1/4W	
R203	1-247-843-11	CARBON 3.3K 5% 1/4W	
R204	1-249-413-11	CARBON 470 5% 1/4W	
R205	1-249-417-11	CARBON 1K 5% 1/4W	
i R251	1-212-869-00	FUSIBLE 33 5% 1/4W	F
R252	1-247-843-11	CARBON 3.3K 5% 1/4W	
R253	1-249-435-11	CARBON 33K 5% 1/4W	
R363	1-249-441-11	CARBON 100K 5% 1/4W	

*	1-663-575-12	POWER SW BOARD	

< CAPACITOR >			
i C991	1-113-916-11	CERAMIC 0.01uF 20% 250V	
< CONNECTOR >			
CN994	1-690-123-51	REED (WITH CONNECTOR) (2 CORE) 2P	
< SWITCH >			
i S991	1-572-267-51	SWITCH, PUSH (AC POWER) (1 KEY)	

The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
*	1-663-576-13	VOL SEL BOARD *****				ACCESSORIS & PACKING MATERIALS *****	
		< CAPACITOR >					
i C992	1-113-916-11	CERAMIC 0.01uF 20% 250V		1-473-944-11	REMOTE COMMANDER (RM-D950)		
		< CONNECTOR >		1-590-925-31	CORD, CONNECTION (AUDIO 100cm)		
CN991	1-580-230-11	PIN, CONNECTOR (PC BOARD) 2P		3-707-584-21	COVER, BATTERY (for RM-D950) (ENGLISH, FRENCH, SPANISH, SWEDISH)		
CN992	1-564-321-00	PIN, CONNECTOR 2P		3-858-365-21	MANUAL, INSTRUCTION (GERMAN, DUTCH, ITALIAN, PORTUGUESE) (AEP)		
CN993	1-770-128-11	PIN, CONNECTOR 2P					
* CN995	1-564-321-21	PIN, CONNECTOR 2P (Singapore)		3-858-365-31	MANUAL, INSTRUCTION (CHINESE) (Singapore)		
		< SWITCH >					
i S992	1-571-722-11	SWITCH, VOLTAGE SELECTION (VOLTAGE SELECTOR) (Singapore)					
		< LINE FILTER >					
i T603	1-424-485-11	FILTER, LINE *****					
		MISCELLANEOUS *****					
6	1-777-844-11	WIRE (FLAT TYPE) (9 CORE)					
7	1-777-845-11	WIRE (FLAT TYPE) (10 CORE)					
105	1-777-873-11	WIRE (FLAT TYPE) (16 CORE)					
114	1-543-653-11	CORE ASSY, BEAD (DIVISION TYPE)					
162	1-777-843-11	WIRE (FLAT TYPE) (30 CORE)					
209	1-775-991-11	WIRE (FLAT TYPE) (16 CORE)					
i 210	8-848-379-31	OPTICAL PICK-UP KSS-213B/S-N					
221	1-777-842-11	WIRE (FLAT TYPE) (10 CORE)					
i CNP1	1-558-568-21	CORD, POWER					
M1	X-4947-303-1	MOTOR ASSY (SLED)					
M2	A-4640-970-A	MOTOR ASSY (SLED)					
i T1	1-431-214-11	TRANSFORMER, POWER (Singapore)					
i T1	1-431-215-11	TRANSFORMER, POWER (AEP) *****					

		HARDWARE LIST *****					
#1	7-685-871-09	SCREW +BVTP 3X6 (S)					
#2	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S					
#3	7-685-871-01	SCREW +BVTP 3X6 (S)					
#4	7-685-885-09	SCREW +BVTP 4X16 (S)					
#5	7-621-770-67	SCREW +PWH 2.6X6					
#6	7-685-872-09	SCREW +BVTP 3X8 (S)					
#7	7-627-852-07	SCREW, RECISION +P 1.7X2.5 *****					

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Replace only with part number specified.

